

A REVISION OF THE GENUS *LEPTOGLOSSUS*
GUERIN (HEMIPTERA: COREIDAE)^{1, 3}

BY

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TABLE OF CONTENTS

Introduction	35
Historical Review	36
Materials and Methods	37
Taxonomic Characters	38
Transverse Fascia on Corium	38
Coloration	39
Tibial Dilations	39
Male Genitalia	45
Genus <i>Leptoglossus</i> Guérin	45
Species Groups	51
Key to Species	54
Acknowledgments	134
Literature Cited	135

ABSTRACT: All previously known species of the genus *Leptoglossus* are discussed. Five new species are described and redescrptions are given for existing species. A discussion of the taxonomic characters used, a key to all species, and 67 figures are included.

INTRODUCTION

A comprehensive world-wide revision of the genus *Leptoglossus* has not been attempted since Stål's *Enumeratio Hemipterorum* in 1870. Much of the material present in museums is largely unidentified, except for the best known species, or where keys to species are available for a particular geographic area. The purpose of this work is to bring together as much information as possible about the genus, to provide a comprehensive key to all existing species, and to redescribe the species that are poorly known. It is hoped that a basis has been established for further research in this group.

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Leptoglossus is chiefly a neotropical genus with 26 of the 38 species found primarily in, or restricted to South America. Of the remaining species found in North and Central America, and the Caribbean, all are clearly related to the South American members. The single Eastern Hemisphere species, *australis* (Fabricius), does not present a baffling zoogeographic problem in view of the relationship between it and *gonagra* (Fabricius). These two species are very closely related, with *australis* an obvious derivative of a *gonagra* like stock that has crossed the water barriers and invaded the Ethiopian, Oriental, and Australo-Papuan regions. Further remarks concerning *gonagra* and *australis* may be found in the discussion under the latter species.

HISTORICAL REVIEW

Guerin first described the genus *Leptoglossus* with *dilaticollis* as the only included species in 1838; however, the generic and specific names date from 1831 as they were used in reference to a figure published by Guérin in that year (Dupuis 1952). *Leptoglossus* remained monotypic until 1870. In 1837, Spinola described *Anisoscelis*, to which all previously and subsequently named species now in *Leptoglossus* were assigned for many years. Stål (1862) described *lineosus* and established the genus *Theognis* to include those anisosceline species which had the first antennal segments equal to the length of the head. Mayr (1865, 1866) described a number of new species in *Theognis*, many of which have since been synonymized, but he provided in some instances well executed descriptions. In 1870 Stål synonymized his genus *Theognis* with *Leptoglossus* and added three new species. Walker (1871) described five species in the genus *Anisoscelis* and one in *Malvana*. All of these belong to *Leptoglossus* and, of these six, three are valid species. Between 1871 and 1894 four more species were added to the genus, of these Distant described one and Berg three. I have synonymized one Berg species and assigned another to subspecific status. The Lethierry and Severin Catalogue in 1894 was the last check list of species to be compiled for *Leptoglossus* with 35 species included. Before 1909 only three species were known from North America north of Mexico, *phyllopus* (Linnaeus), *oppositus* (Say), and *corculus* (Say). Subsequently Barber and Heidemann have described between them five additional species.

Kiritshenko (1935) resurrected the genus *Theognis* as distinct from *Leptoglossus*. Hussey (1953) supported Kiritshenko's separation of the two genera. For reasons discussed later, I do not agree with Kiritshenko, and have retained *Theognis* as a junior synonym of *Leptoglossus*.

MATERIALS AND METHODS

The type specimens of the following workers were made available through the cooperation of the various museum curators: the Stål collection from the Stockholm Museum; Walker and Dallas types from the British Museum (Natural History); the Berg collection from the La Plata Museum; Blote's types from the Leiden Museum, Holland; and the types of Heidemann and Barber at the United States National Museum. Dr. I. Lansbury at Oxford compared material and made drawings of the genitalia and tibial dilations of the Westwood types. Approximately 2500 specimens were examined for this study.

Genitalia dissections were accomplished according to the methods described by Ashlock (1957 and 1967). The aedeagus required much time and effort to inflate osmotically, and most attempts resulted in failure. By gently pulling on the membranous portion, it is usually possible to extend the aedeagus and with further careful manipulation the various lobes and appendages can be exposed (although their exact shape can only be estimated by this process). The aedeagal drawings were made from an aedeagus extended manually and therefore are only approximations of the size and shape of the various lobes. The genital capsule drawings are of the posterior view with only the dorsal margin and a portion of the lateral margin shown; the shape of the capsule, except for the dorsal margin, is essentially the same for all species. The corresponding morphological structures were drawn to the same scale.

All measurements are in millimeters. The length of the head is measured along a median line from the base of the head to the apex of the juga. Although the tylus is the furthest extension of the head, that portion of it which extends past the juga was not included since it is variable between individuals of the same species and between different species. One example of this is in *clypealis* Heidemann which has the apex of the tylus produced as an acute spine. Width of head is across the eyes when viewed dorsally; interocular distance is the shortest distance between the eyes on the dorsal surface; anteocular distance is measured from the anterior margin of an eye to the apex of the juga; the intersegmental node between antennal segments three and four was included in the length of the third segment; length of pronotum is measured along the median line as is that of the scutellum; width across humeri is also the greatest width of pronotum; total length is the distance from the apex of the juga to the apex of the folded wings; the length of the hind tibia is measured from an imaginary base line drawn across the tibia from the inner, almost right-angle bend at the tibiofemoral joint, to the distal end of the tibia; the lengths of the inner and outer tibial dilations are measured from the same base

line explained for the tibia, to the end of the dilations, regardless of where the dilations actually begin on the proximal portion of the tibia. An exact measurement is sometimes difficult because the dilation diminishes very gradually distally. The width of the dilations is measured from the center of the tibia to the margin of the dilations, with the dilations held in a horizontal plane.

Complete descriptions are given for the less well known species. The North American species are described briefly, and the reader is referred to the original and readily available descriptions of Barber (1918), Heidemann (1909, 1910), and the descriptions given in Blatchley (1926). The references for each species include all synonymies, and additional papers that give useful descriptions, figures, keys, or biological information. Many older references that were cited in the Lethierry and Severin Catalogue (1894), and also those papers pertaining to locality records that were cited in the Van Duzee Catalogue (1917), are omitted here.

Host plant records cited without references are taken from labels on specimens in the material examined.

TAXONOMIC CHARACTERS

Most of the characters used in this paper are those employed by previous workers on this genus. In the past, some taxonomic confusion has resulted due to reliance on only one or two of what have proven to be variable characters. The significant characters, their usefulness in distinguishing species, groups of species, and their variability are discussed below.

(1) TRANSVERSE FASCIA ON CORIUM—This is an extremely useful character and its presence or absence, and shape can be determined with ease. In many species the pale fascia is as constant as any morphological character, but occasionally the fascia is absent in species that normally have it, such as *ingens* (Mayr), *stigma* (Herbst), *concolor* (Walker), *neovexillatus* n. sp. and *zonatus* (Dallas). In *ingens* the absence or presence of the fascia seems to be correlated with geographic distribution. The fascia also varies in completeness, and may be wide and brightly pigmented or narrow and faint. The terms "irregular" and "straight" pertain to the margins of the fascia: an irregular fascia more or less follows the branching of the radial and medial and the mediocubital cross-vein, this produces sharply angled saw-like margins; the straight fascia occupies the same area as an irregular one, but the area between the veins is also pigmented, a condition producing an evenly margined fascia. *L. ashmeadi* Heidemann and *macrophyllus* Stål have an irregular fascia, but on some individuals this is difficult to determine as the margin

may be only slightly angular and similar to a straight margined fascia. In order to avoid confusion in using the key, I have considered these two species as possessing both types of fascia.

(2) COLORATION—There are a number of useful and reliable color patterns that can be used in grouping species, as well as in separating closely related species. A large group has the thoracic and abdominal venter mottled with numerous small piceous spots (about the size of an ocellus). Another useful pattern is the presence of contrasting yellowish maculae on the thoracic pleura; these maculae are large (about the size of an eye). In one group of species, the individuals have five or six maculae on each side of the thorax; in another group the maculae number approximately ten or twelve. A third color pattern on the thoracic pleura is the shape of pale longitudinal fasciae. Members of this genus also possess various contrasting spots, fasciae, and rectangular bands on the pronotum. These color patterns are useful for distinguishing related species, but in some instances are highly variable and must be used with caution. The key contains a number of couplets which rely on pronotal color patterns, but I have made every attempt to use them only where those species involved showed consistence in expressing a particular pattern.

(3) TIBIAL DILATIONS—These membranous plate-like expansions on the hind tibiae (Figs. 52–63) can be at times completely diagnostic in themselves as in *corculus*, *gonagra*, *alatus*, and *lineosus*, or in other instances the dilations are at best only a secondary character. Some examples of the latter case are typical of the species *zonatus*, *stigma*, *concolor*, and *chilensis*.

The outer dilation refers to the larger dilation, which is directed laterally when the hind tibia is in the position shown in Figs. 1–5. The inner dilation is the medially directed portion. The term “lanceolate” refers to a dilation that has the margin entire or almost entire (Figs. 57–61); and “phylliform” pertains to a dilation which is emarginate or scalloped on the margin (Figs. 52–56, 62–63). The inner dilation is in all species lanceolate with small teeth on the margin, and in all but a few species it is smaller both in width and length than the outer. The outer dilation may be either lanceolate or conspicuously phylliform. A phylliform dilation has a spine-like tooth where an edge of an emargination comes to a point. In many of the older descriptions a phylliform dilation was referred to as having “two or three teeth.” A certain amount of variation in the shape of a phylliform dilation can be expected. All species with this type of a dilation may have one to two deep emarginations, and only rarely will all the emarginations be shallow. A lanceolate outer dilation will usually have at least one shallow emargination. The width and length

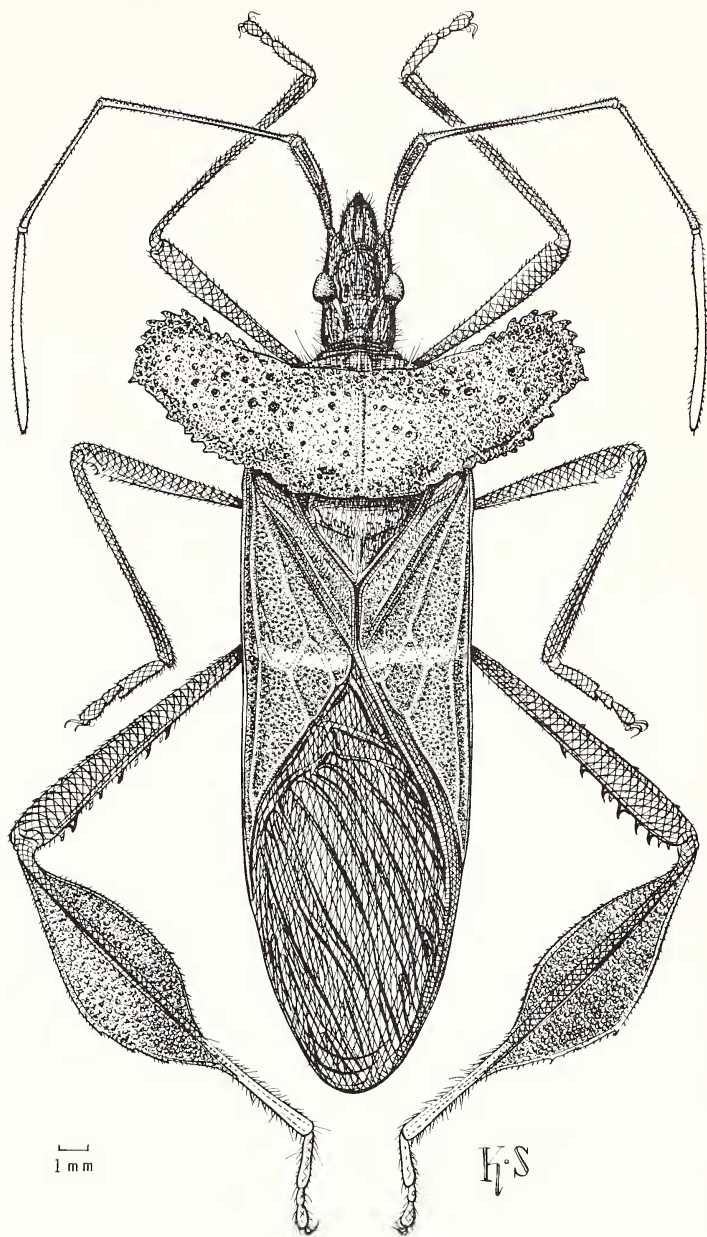
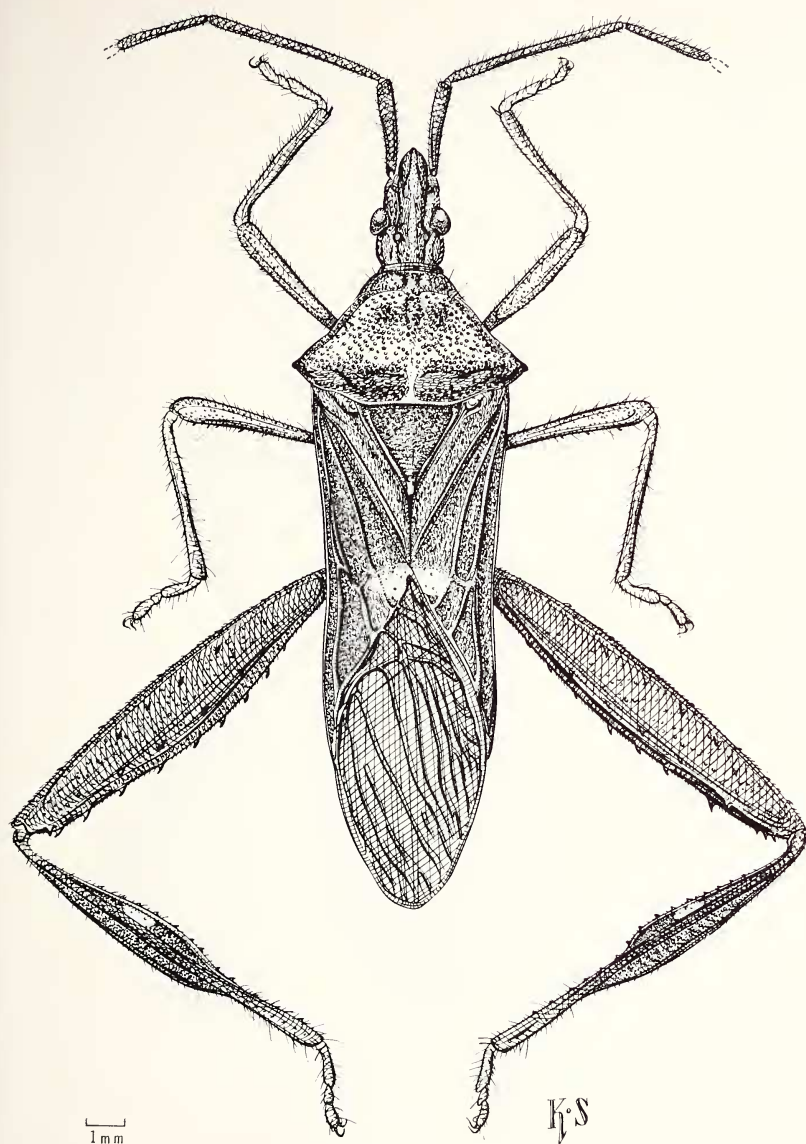


FIG. 1. *Leptoglossus dilaticollis*.

FIG. 2. *Leptoglossus crassicornis*.

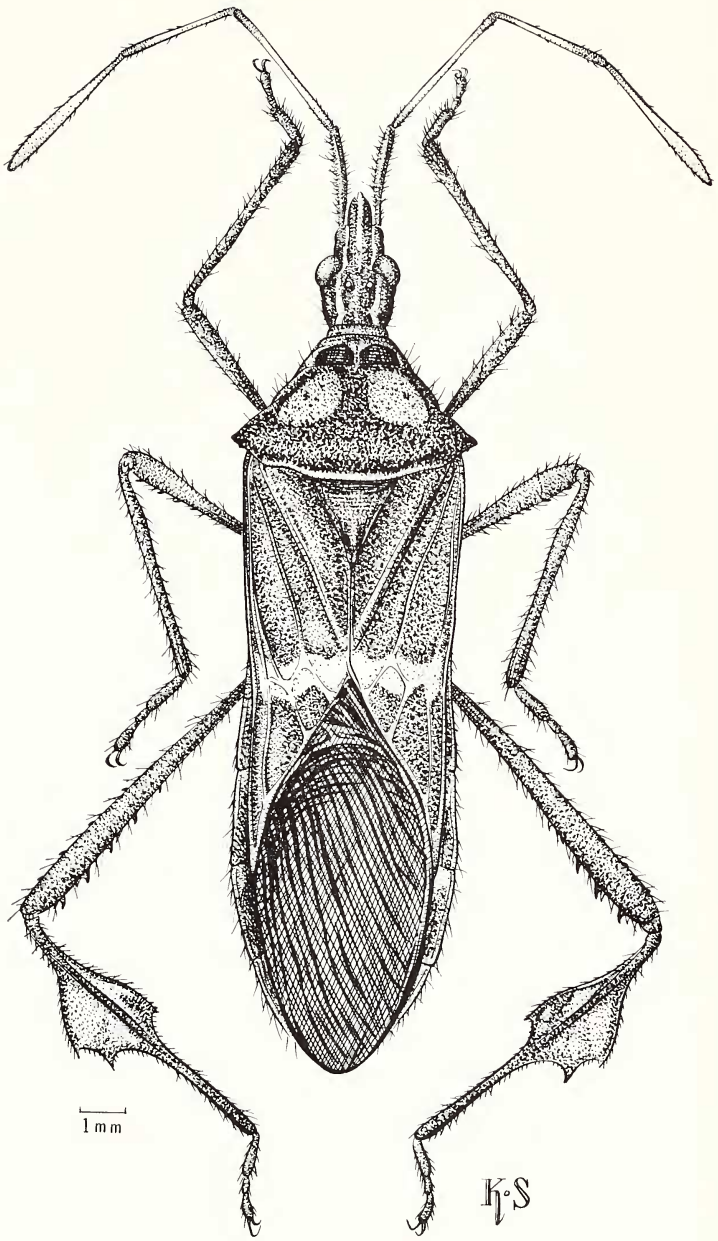
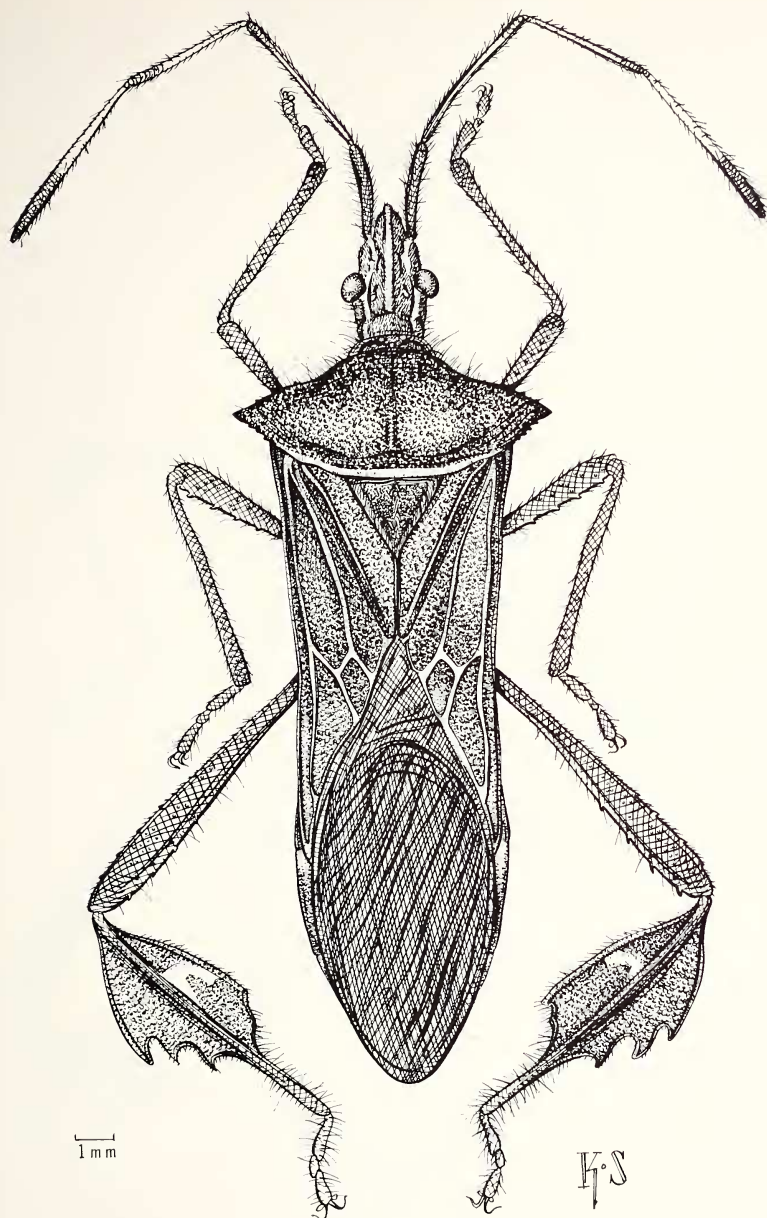


FIG. 3. *Leptoglossus grenadensis*.

FIG. 4. *Leptoglossus pallidivenosus*.

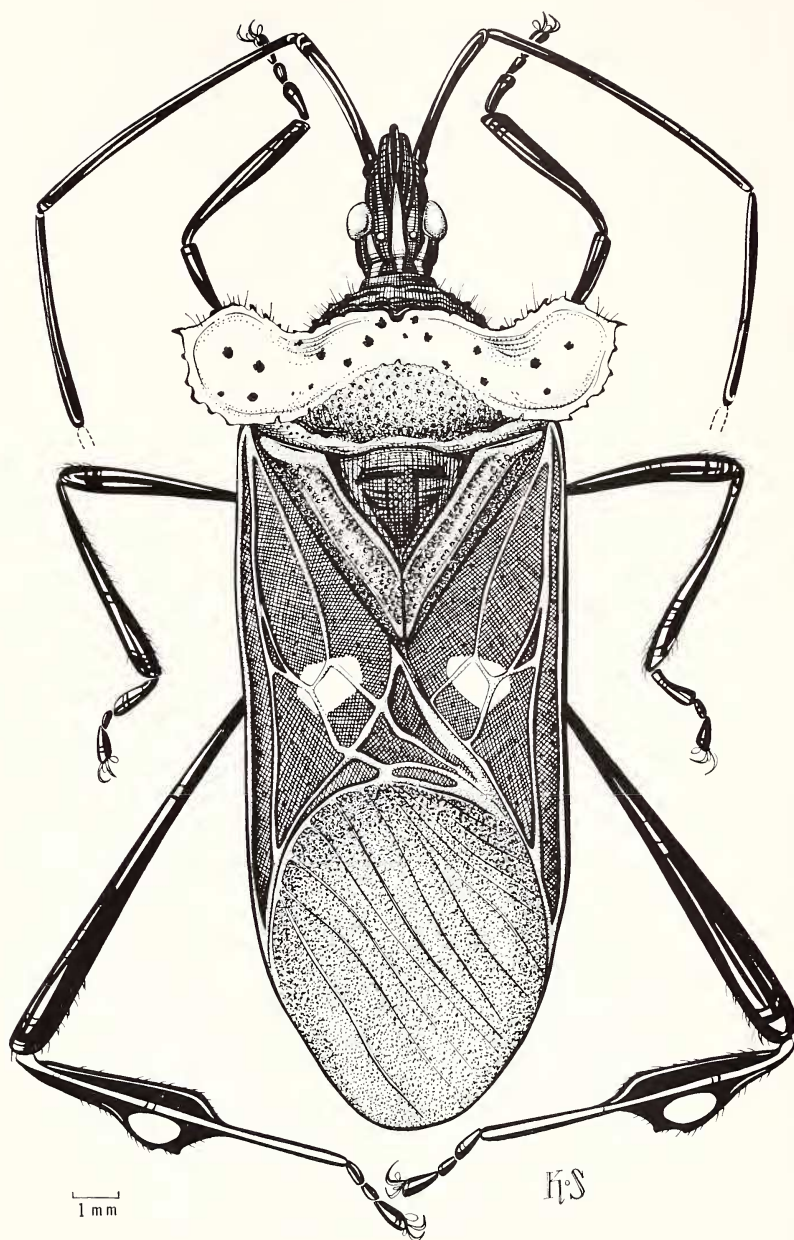


FIG. 5. *Leptoglossus alatus*.

of a dilation are also useful characters, but the length, as mentioned earlier, must be used carefully. I have used the various shapes of the dilation as a diagnostic character only when there was a considerable and constant difference between species.

(4) MALE GENITALIA—The various parts of the male genitalia have been a rewarding character in all but a few instances. By far the most useful structure is the aedeagus. This has proven to be diagnostic between closely related species when the clasper and capsule were similar, and also has been useful in delineating groups of species. I have limited my discussion of the aedeagus to the dorsal sac (Schaefer 1968) of the conjunctiva, because this area is most useful, with its various lobes and sclerotized spines. The different lobes on the dorsal sac are indicated according to their position as proximal, medial, or distal (Figs. 64–67). The dorso-lateral appendage (Fig. 67) is generally a well sclerotized flat appendage and basal to the dorsal sac. For descriptive purposes I have referred to the clasper as having three parts, a base, shank, and hook (Fig. 17). The postero-lateral dorsal margin of the capsule is an area displaying good specific characters. I have used the terms median notch and dorsal prongs in describing the shape of the margin (Fig. 42).

Genus *Leptoglossus* Guérin

Leptoglossus Guérin, 1831 (1838):pl. 12, fig. 9.—Guérin, 1838:174.

Stål, 1870:160.—Kirkaldy, 1906:257.—Gibson and Holdridge, 1918:3.

Anisoscelis Spinola, 1837:200.

Theognis Stål, 1862:294.—Kiritschenko, 1935:191.—Hussey, 1953:33.

Small to large species, elongate; head porrect, longer than wide and usually shorter than length of pronotum, prolonged anterior to antenniferous tubercles, tylus slightly exceeding juga usually rounded, ocelli widely separated, distance between ocelli greater than distance from ocellus to eye; pronotum subhexagonal with anterior face declivent, humeral areas usually expanded, sometimes greatly so, greatest width of pronotum across humeri, posterior margin concave, in front of it an unevenly raised transverse ridge, calli present; length and width scutellum subequal; labial length variable, segments one and two subequal with third shortest, fourth variable; first antennal segment curved and thickest, usually subequal to length of head, at least longer than anteocular distance, first segment shortest, with second segment longer than third, fourth segment equal to or longer than third segment; membrane slightly surpassing abdomen; all femora

armed beneath with two rows of distally directed teeth, individual teeth gradually increasing in size distad, tuberculate laterally and above, tubercles more or less oriented in rows, hind femora swollen and usually thicker in males than females; hind tibiae dilated, outer dilation variable in size and shape, usually wider than interocular distance.

Type species—*Leptoglossus dilaticollis* Guérin, 1831. Monobasic.

Stål established the genus *Theognis* in 1862, and synonymized it with *Leptoglossus* in 1870. The generic status remained unchanged until Kiritshenko (1935) restored *Theognis* as distinct. This action left only *dilaticollis* in *Leptoglossus*.

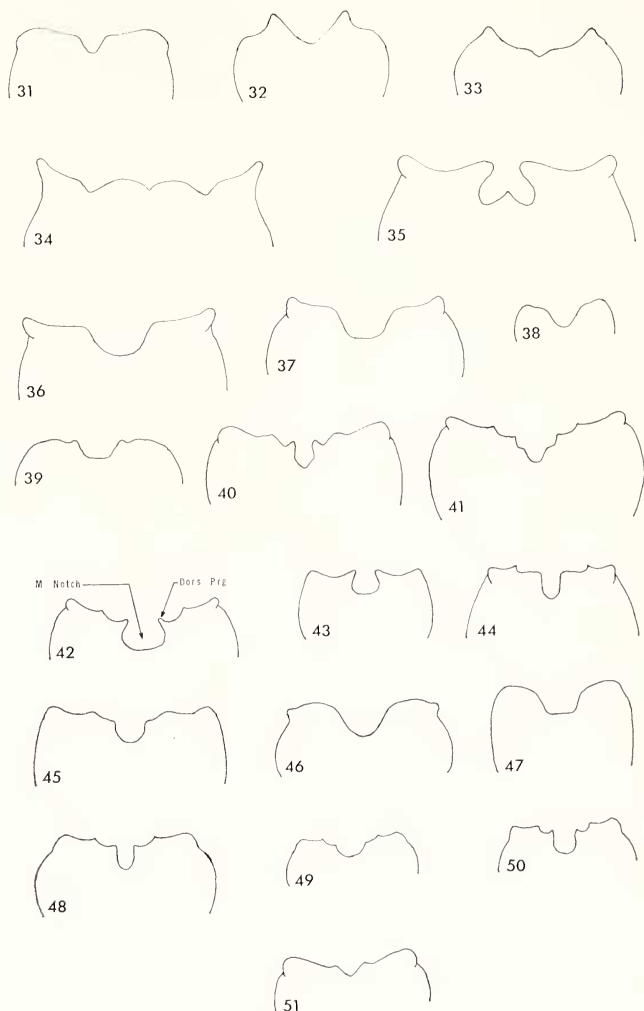
The following is a discussion of the characters that Kiritshenko listed in his diagnosis of *Leptoglossus*. After each of his characters, I point out similar characters that can be found in species in the genus *Theognis*, and which in my opinion precludes the separation of the two genera.

(1) Pronotum with the humeral angles produced as long anteriorly curving processes—*alatus* (Walker) (Fig. 5) has similar angles, although not quite so wide. (2) All lateral margins strongly dentate. *L. alatus* has equally long teeth, and *dentatus* Berg despite its small size is strongly dentate. (3) Pronotal surface above with deeply excavated rounded foveolae. *Rubrescens* (Walker) and *fulvicornis* (Say) both have rugulose and deeply pitted pronotal surfaces, although the punctations are not so deep or so prominent. (4) Body robust, very large species (length 27–39 mm). The two females of *humeralis* n. sp. approach the lower limit of the range for *dilaticollis*. It should be pointed out that the lower limit of the range for *dilaticollis* is of a male, and the upper limit for *humeralis* is of females, so that *dilaticollis* is actually larger. (5) The length of the head is three times the interocular distance. Not all *dilaticollis* specimens have the head quite this long, the lowest ratio of seven specimens was 2.5 and a single specimen of *fulvicornis* has the head 2.4 times the interocular distance. These differences between the two “genera” are ones of degree, not of kind.

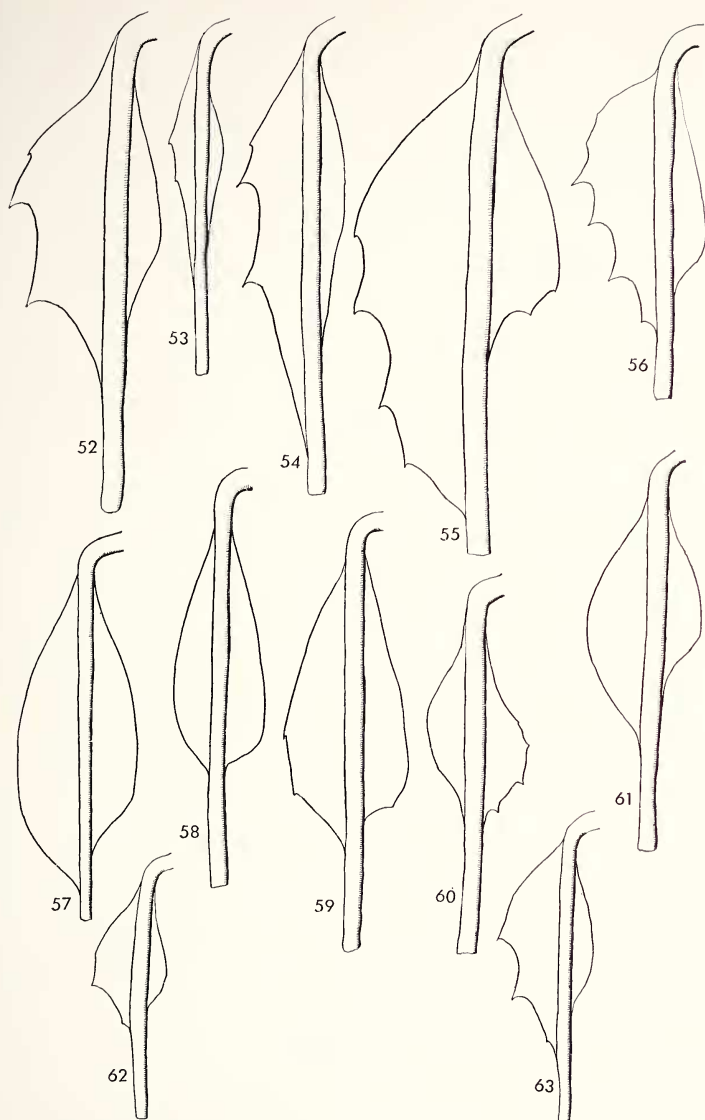
Stronger evidence for retaining *Theognis* species with *Leptoglossus* is the similarity of the genitalia, and this is discussed under the *dilaticollis* group. It is true that *dilaticollis* is a unique species, but so is *alatus*. The genitalia of *lineosus* and *subauratus* Distant are as different from other species as are the external characters of *dilaticollis*; therefore, they too are unique. The entire genus is not a homogeneous unit, and until a complete re-evaluation of the generic limits and the relationships among genera of the Anisoscelidini is



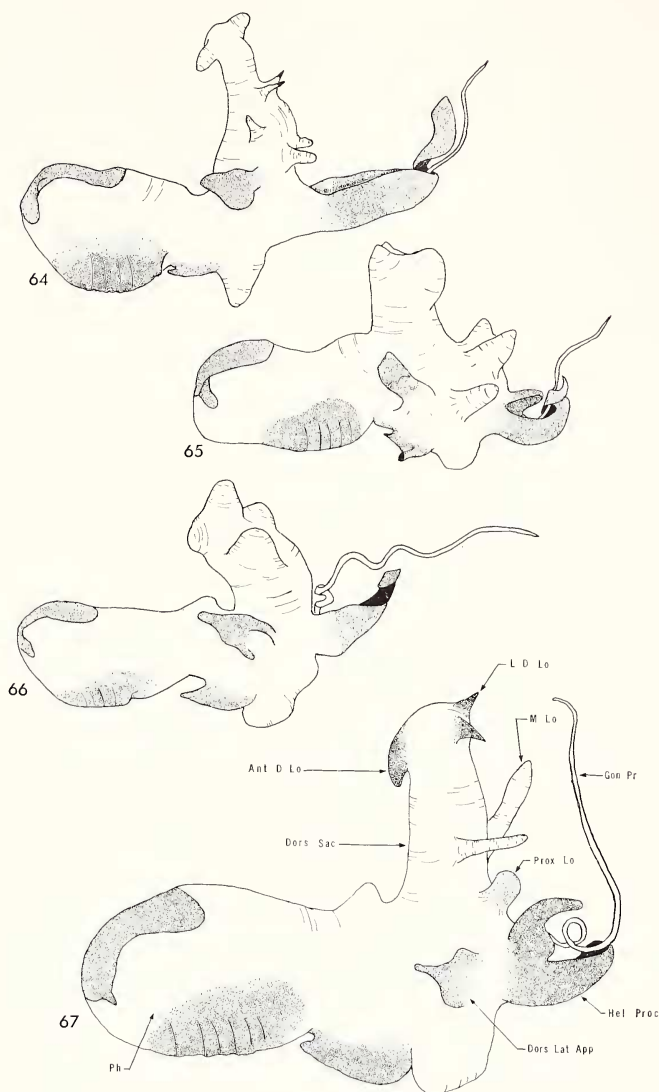
FIGS. 6-30. Right claspers, dorsal view. Fig. 6. *Leptoglossus cinctus*. Fig. 7. *L. harpagon*. Fig. 8. *L. lineosus*. Fig. 9. *L. dilaticollis*. Fig. 10. *L. fulvicornis*. Fig. 11. *L. rubescens*. Fig. 12. *L. australis*. Fig. 13. *L. chilensis*. Fig. 14. *L. quadricollis*. Fig. 15. *L. dentatus*. Fig. 16. *L. macrophyllus*. Fig. 17. *L. ingens*: Sh, shank; Hk, hook; M Lo, median lobe; I B Lo, inner basal lobe. Fig. 18. *L. zonatus*. Fig. 19. *L. impictipennis*. Fig. 20. *L. conspersus*. Fig. 21. *L. stigma*. Fig. 22. *L. concolor*. Fig. 23. *L. pallidivenosus*. Fig. 24. *L. lonchoides*. Fig. 25. *L. balteatus*. Fig. 26. *L. corculus*. Fig. 27. *L. occidentalis*. Fig. 28. *L. clypealis*. Fig. 29. *L. brevirostris*. Fig. 30. *L. ashmeadi*.



FIGS. 31-51. Genital capsules, posterior view. Fig. 31. *Leptoglossus cinctus*. Fig. 32. *L. harpagon*. Fig. 33. *L. lineosus*. Fig. 34. *L. dilatipennis*. Fig. 35. *L. fulvicornis*. Fig. 36. *L. rubescens*. Fig. 37. *L. australis*. Fig. 38. *L. chilensis*. Fig. 39. *L. dentatus*. Fig. 40. *L. macrophyllus*. Fig. 41. *L. ingens*. Fig. 42. *L. zonatus*, Dors Prg, dorsal prongs; M Notch, median notch. Fig. 43. *L. impictipennis*. Fig. 44. *L. concolor*. Fig. 45. *L. pallidivinosus*. Fig. 46. *L. corculus*. Fig. 47. *L. occidentalis*. Fig. 48. *L. clypealis*. Fig. 49. *L. brevirostris*. Fig. 50. *L. ashmeadi*. Fig. 51. *L. balteatus*.



FIGS. 52-63. Tibial dilations. Fig. 52. *Leptoglossus australis*. Fig. 53. *L. australis*. Fig. 54. *L. gonagra*. Fig. 55. *L. ingens*. Fig. 56. *L. quadricollis*. Fig. 57. *L. corculus*. Fig. 58. *L. occidentalis*. Fig. 59. *L. clypealis*. Fig. 60. *L. lineosus*. Fig. 61. *L. lonchoides*. Fig. 62. *L. chilensis chilensis*. Fig. 63. *L. chilensis concaviusculus*.



FIGS. 64-67. Aedeagi, lateral view. Fig. 64. *Leptoglossus cinctus*. Fig. 65. *L. harpagon*. Fig. 66. *L. rubescens*. Fig. 67. *L. ingens*, Ant D Lo, anterior distal lobe; L D Lo, lateral distal lobe; M Lo, median lobe; Prox Lo, proximal lobe; Dors Sac, dorsal sac; Gon Pr, gonoporal process; Hel Proc, helical process; Dors Lat App, dorso-lateral appendage; Ph, phallosoma.

accomplished, there is no reason to revive or establish monotypic genera based on a few bizarre external characters.

SPECIES GROUPS

The aedeagus and the color patterns have been used to establish species groups. Some species and groups of species may not be natural units, nor related to one another to the same degree as other groups. These groups, in turn, have been assembled into two major divisions based on the conformation of the dorsal sac on the conjunctiva. Within these two divisions, I have discussed the closely related species as species groups.

DIVISION A

Comprised of 13 species which have the dorsal sac of the conjunctiva without a sclerotized anterior distal lobe (Figs. 64–66), and which, with the exception of *dilaticollis* and *fulvicornis*, lack the small piceous spots on the venter. Members of this division are more diverse than the species in Division B.

Cinctus Group—This group includes *cinctus* (Herrich-Schaeffer), *fasciatus* (Westwood), and *crassicornis* (Dallas), and is characterized by the presence of six yellow spots on each side of the thoracic pleura, a yellow spot on the last abdominal tergum (frequently absent in females), lanceolate tibial dilations, and the aedeagus (Fig. 64) with two pairs of widely separated medial lobes.

Harpagon Group—This group includes two “pairs” of species each pair only distantly related to the other. *L. harpagon* (Fabricius) and *flavosignatus* Blöte are characterized by the presence of two yellow spots each, on the disk and posterior margin of the pronotum, two spots on the corium, and six yellow spots on each side of the thoracic pleura. The dorsal sac of the conjunctiva (Fig. 65) is unsclerotized, and bears three large proximal lobes. The tibial dilations are short and not deeply emarginate. *L. lineosus* and *subauratus* are characterized by having two pale longitudinal fascia on each side of the thoracic pleura, strongly contrasting pale veins on the clavus and corium, and lanceolate outer tibial dilations (Fig. 60).

The species pairs are grouped primarily on the shape of the clasper (Figs. 7–8) and the capsules (Figs. 32–33). In both groups the clasper has the inner margin of the shank deeply scooped out and the posterior dorsal margin of the capsule is greatly produced backwards. In addition, the dorso-lateral appendage of the conjunctiva is long and heavily sclerotized. The declivous anteocular portion of the head is conspicuously evident in *lineosus* and *subauratus*, but there is only a slight indication of this in *harpagon* and *flavosignatus*.

L. alatus also belongs to this group and most closely resembles *lineosus* and *subauratus* because of the declivent anteocular portion of the head. However, the shape of the pronotum (Fig. 5) and the color is so strikingly different that it is obviously a highly derived species.

Dilaticollis Group—This is probably an artificial grouping composed of *fulvicornis*, *rubescens*, and *dilaticollis*. All three species have the clasper with the base broad, the inner basal lobe obsolete and the shank without a median lobe. *L. fulvicornis* and *dilaticollis* have a long unsclerotized dorsal sac whereas in *rubescens* it is short. The various lobes on the dorsal sac and the shape of the dorsal margin on the capsule are all quite different. This group shares in common the presence of a yellowish longitudinal stripe on the abdominal dorsum, a rugulose-like pronotal surface, dentate pronotal margins, and lanceolate tibial dilations. Both *fulvicornis* and *dilaticollis* have small piceous spots on the venter as do members in Division B, but the importance of this character as an indication of relationships is difficult to assess, since the aedeagi are so different.

Australis Group—*L. australis* and *gonagra* are the only members of this group and are characterized by the presence of a pale arcuate transverse fascia on the pronotal disk and pale longitudinal vittae on the abdominal venter. The similar base on the clasper and the simple dorsal sac on the conjunctiva with only two short median lobes near the apex suggest that *fulvicornis* is somewhat related, but as mentioned in the previous group, these species are rather specialized members of this genus.

DIVISION B

This Division contains the largest number of species, and on the whole is a rather uniform complex. The twenty-four species included here may be characterized as follows: a distinctive aedeagus with the dorsal sac of the conjunctiva (Fig. 67) bearing low rounded usually sclerotized proximal lobes, a pair of median lobes which may have secondary appendages, and usually bearing sclerotized distal lobes of which one is larger and anterior to the sclerotized smaller more laterally placed lobes. With few exceptions the thoracic and abdominal venter is mottled with numerous small piceous spots.

Chilensis Group—Members of this group lack the transverse fascia on the corium, have a short labium usually extending to between the meso- and metasterna, serrate to dentate lateral pronotal margins, and a genital capsule without dorsal prongs. Species in this group are *chilensis*, *impictus*, *quadricollis*, and *dentatus*.

Stigma Group—This group of species possesses a genital capsule with dorsal prongs (Figs. 40–43), claspers with both the inner basal

lobe and the median lobe on the shank well developed, usually a long labium, conspicuously phylliform dilations, and a transverse fascia which, when present is irregular. Most of the members are of medium size. Included species are *stigma*, *zonatus*, *concolor*, *impictipennis*, *neovexillatus*, *ingens*, *macrophyllus*, *oppositus*, *grenadensis*, *conspersus*, *lonchoides*, *pallidivenosus*, and *humeralis*. Within this group *ingens* and *macrophyllus* are most closely allied and have a long outer tibial dilation, a "V" shaped median notch on the genital capsule, and low dorsal prongs. *L. zonatus*, *neovexillatus*, and *impictipennis* have similar genitalia and two rounded spots on the pronotum. *L. grenadensis* and *conspersus* also possess pronotal markings, but differ from the last three species in that the anterior distal lobe on the dorsal sac is larger and more heavily sclerotized, and the inner basal lobe on the clasper is longer (Fig. 20). The clasper of *oppositus* and *stigma* is very similar to that of *zonatus* and its relatives, although *oppositus* and *stigma* do not have pronotal markings.

L. concolor and *pallidivenosus* lack dorsal prongs on the capsule. Nevertheless, the structure of the dorsal sac and the general habitus clearly ally these species with the other members of the *stigma*-group (see discussion under the individual species).

L. lonchoides apparently belongs to this group, despite external differences, because of similarities in the genitalia to that of *zonatus*. Although males of *humeralis* were not available, this species will probably prove to belong to this group on the basis of the long labium and phylliform tibial dilations.

Phyllopus Group—*L. phyllopus* and *balteatus* are included here and this group is characterized by a straight transverse fascia on the corium, low rounded dorsal prongs on the capsule (Fig. 51), a clasper (Fig. 25) without a median lobe, and a poorly developed inner basal lobe. These two species are close to the *stigma*-group in general habitus.

Corculus Group—Externally these species are very similar to one another, with the same general color pattern, broadly rounded humeral angles, a gradually declivent pronotum, an irregular transverse fascia, and lanceolate tibial dilations. The group includes three North American species *corculus*, *clypealis*, and *occidentalis*. The clasper (Figs. 26–28) and capsule (Figs. 46–48) of the species differ, but the aedeagi are essentially the same. The clasper of *clypealis* is similar to that of *zonatus*, and there is an indication of dorsal prongs on the capsule. The shape of the pronotum and the tibial dilation of the *corculus*-group resemble *lonchoides*, so that there seems to be a definite link in both genitalia and general habitus to the *stigma*-group.

The remaining two species in this Division are *ashmeadi* and

brevirostris, both appearing to be derived members of the *stigma*-group. These two species share in common an irregular transverse fascia; a short labium, extending between the meso- and metacoxae; small size, and, on the dorsal sac, a sclerotized area near the larger median lobe. *L. ashmeadi* has small dorsal prongs on the capsule, but the short labium, orange and black pigmentation, and the lack of numerous small piceous spots on the venter rather isolates this species from *brevirostris* and the *stigma* group. *L. brevisrostris* on the other hand, resembles a diminutive *stigma* or *concolor*, but has a rounded median notch and obsolete dorsal prongs on the genital capsule.

KEY TO SPECIES OF *Leptoglossus*

1. Thoracic pleura dark with at least three, usually more, strongly contrasting yellowish maculae (about the size of an eye), or yellowish maculated fasciae; thoracic and abdominal venter without numerous small piceous spots 34
 Thoracic pleura orange to dark reddish brown without strongly contrasting yellowish markings; thoracic and abdominal venter usually with numerous small piceous spots 2
2. Width across humeri 5.5 to 6 times width across anterior pronotal margin; large species, length 26–39 mm 3
 Width across humeri at most 5 times width anterior pronotal margin; smaller species less than 25 mm in length 4
3. Pronotum with humeral areas produced as large, broadly rounded anteriorly curving processes; corium with a straight transverse fascia; hind tibiae with outer dilations lanceolate (Fig. 1) *dilaticollis* Guerin (p. 79)
 Pronotum with humeral areas produced into long, gradually tapering projections; corium without a transverse fascia; hind tibiae with outer dilations distinctly phylliform
 *humeralis* n. sp. (p. 126)
4. Transverse fascia on corium always present and straight 5
 Transverse fascia on corium irregular, not straight; or fascia absent 8
5. Dorsum piceous; all marginal areas of pronotum continuously and widely yellowish orange
 *ashmeadi* Heidemann (p. 134)
 Dorsum reddish brown; at most only the posterior marginal area of the pronotum yellowish 6
6. Anterior pronotal disk with a yellowish transverse rectangular band; inner tibial dilation considerably shorter

- than outer, occupying 65–70% the length of outer dilations *macrophyllus* Stål (p. 104)
- Anterior pronotal disk concolorous or with two longitudinally ovoid spots; inner tibial dilations slightly shorter than outer, occupying 85–90% the length of outer dilations 7
7. Humeral angles acuminate, acute and obliquely ascending; pronotal disk with contrasting yellow areas in the form of distinctly separated ovoid spots or larger more quadrate spot partially fusing medially, posterior marginal area of pronotum yellow; hind wings unicolorous (West Indies) *balteatus* (Linnaeus) (p. 97)
- Humeral angles more rounded, subacute; pronotum concolorous, disk rarely with yellowish areas (if yellow areas are present, they are poorly defined, more diffused and dull), posterior marginal area of pronotum never yellow; hind wings with basal half dark, distal half clear (North and Central America). *phyllopus* (Linnaeus) (p. 100)
8. Pronotum with lateral and postero-lateral margins serrate or dentate 9
- Pronotum with lateral margins entire; postero-lateral margins serrate, dentate, or entire 18
9. Clavus and corium dark with strongly contrasting pale veins, a pale transverse fascia, or only two large pale maculae 10
- Clavus and corium without strongly contrasting pale markings, usually unicolorous 12
10. Humeral areas produced as large broadly rounded lateral projections; pronotum piceous with a wide orange band on disk; corium with two large pale maculae (Fig. 5) *alatus* (Walker) (p. 71)
- Humeral areas produced as tapering lateral projections not broadly rounded; pronotal disk unicolorous; corium with a pale irregular transverse fascia 11
11. Labium short extending at most to middle of metasternum; posterior marginal area of pronotum concolorous with disk or slightly darker, never pale; small species less than 16 mm in length (North America) *brevirostris* Barber (p. 133)
- Labium longer extending to at least anterior margin of second abdominal sternum; posterior marginal area of pronotum pale, strongly contrasting with remainder of disk; larger species, 20 mm or more in length (Fig. 4) (Panama) *pallidivenosus* n. sp. (p. 128)

12. Labium long, extending to at least middle of third abdominal sternum; entire dorsum unicolorous dark reddish brown; abdominal dorsum piceous with a yellow median longitudinal stripe the width of scent gland scars 13
 Labium shorter rarely extending to posterior margin of second abdominal sternum (usually to middle of metasternum); dorsum with at least some dark and lighter areas; abdominal dorsum unicolorous or with lateral areas yellow but never with a central yellow longitudinal stripe 14
13. Pronotal humeral area broadly rounded with humeral angles blunt, non-acute (North America)
 *fulvicornis* (Westwood) (p. 78)
 Pronotal humeral area expanded into large gradually tapering projections, humeral angles acute (Brazil)
 *rubescens* (Walker) (p. 76)
14. Entire length of lateral pronotal margins with well developed teeth; a single large rounded piceous macula (about the size of an eye) on mesopleuron; abdominal dorsum mesally dark with lateral areas largely yellow
 *dentatus* Berg (p. 95)
 Anterior half of pronotal lateral margins entire, only the posterior half serrate; mesopleuron with at most small piceous maculae (about the size of an ocellus); abdominal dorsum without yellowish areas 15
15. Male genital capsule with prominent dorsal prongs (Fig. 43); anterior half of corium with conspicuously less pubescence than posterior half, this pubescence very dense on veins; hind tibiae with width of outer dilations equal to or greater than width of head
 *impictipennis* Stål (p. 116)
 Male genital capsule without dorsal prongs; pubescence evenly distributed over clavus and corium, if pubescence more dense on posterior half of corium then hind tibiae with width of outer dilations subequal to interocular distance 16
16. Wider more robust species, total length less than 2.5 times width across humeri; dorsal surface of male hind femora with 15–20 prominent tubercles ... *impictus* (Stål) (p. 91)
 Narrower more elongate species, total length greater than 2.5 times width across humeri; dorsal surface of male hind femora with at most 10 prominent tubercles 17
17. Fourth antennal segment averaging 1.2 times width of head; hind tibiae (Fig. 62) with outer dilations narrower and

- shorter occupying 62–71% the length of hind tibiae; entire venter usually with numerous small piceous spots
 ----- *chilensis chilensis* (Spinola) (p. 85)
- Fourth antennal segment averaging 1.5 times width of head; hind tibiae (Fig. 63) with outer dilations wider and longer, occupying 71–80% the length of hind tibiae; numerous small piceous spots usually confined to abdominal midventer ----- *chilensis concaviusculus* Berg (p. 88)
18. Hind tibial dilations lanceolate, without deep emarginations along outer margins (Figs. 57–59, 61) ----- 19
 Hind tibial dilations conspicuously phylliform with at least one (usually more) deep emargination (Figs. 55–56) -- 22
19. Tylus extending beyond juga as a porrect spine which is as long as, or longer than, length of an eye; broad irregular transverse fascia on corium --- *clypealis* Heidemann (p. 132)
 Tylus rounded or pointed apically, but never spinosely produced; transverse fascia on corium narrow, confined to veins or absent ----- 20
20. Labium short, reaching at most to middle of third abdominal sternum, third labial segment never extending beyond anterior margin of metasternum; pronotal lateral margins straight, humeral angles acute (Brazil) -----
 ----- *lonchoides* n. sp. (p. 124)
 Labium long, reaching well onto abdomen, at least to the anterior margin of fourth abdominal sternum, third labial segment extending to at least posterior margin of metasternum; pronotal lateral margins sinuate, humeral angles broadly rounded (North America) ----- 21
21. Inner and outer tibial dilations of nearly equal length, dilations shorter, occupying less than 70% length of hind tibia (Fig. 58) ----- *occidentalis* Heidemann (p. 131)
 Inner and outer tibial dilations not of equal length, outer dilations conspicuously longer than inner and occupying 85% or more length of hind tibia (Fig. 57) -----
 ----- *corculus* (Say) (p. 130)
22. Hind tibiae with outer dilations very long extending for 85–95% length of tibiae and inner dilations much shorter occupying 55–70% length of outer dilations (Fig. 55) -- 23
 Hind tibiae with outer dilations shorter occupying 80% or less length of tibiae and inner dilations only slightly shorter than outer dilations ----- 24
23. Dorsum light reddish brown; anterior portion of pronotal disk with a yellowish rectangular transverse band not

- reaching lateral margins *macrophyllus* Stål (p. 104)
- Dorsum piceous to dark reddish brown; pronotal disk unicolorous or the entire anterior half of pronotum before humeri yellow *ingens* (Mayr) (p. 102)
24. Pronotum dark without strongly contrasting yellowish and dark areas (specimens of *quadricollis* may have an entirely yellow pronotum) 25
- Pronotum with strongly contrasting yellowish and dark areas 29
25. Labium short, not extending past metasternum; fourth labial segment shorter than first antennal segment 26
- Labium longer, usually extending well onto abdomen, at least past the posterior margin of second abdominal sternum; fourth labial segment longer than first antennal segment 27
26. Transverse fascia on corium present (occasionally very faint); tibial dilations short, occupying 70% or less length of hind tibiae (North America) .. *brevirostris* Barber (p. 133)
- Transverse fascia on corium absent; tibial dilations longer, occupying 75–80% length of hind tibiae (Fig. 56) (Brazil) *quadricollis* (Westwood) (p. 93)
27. Postero-lateral margins of pronotum entire; first antennal segment unicolorous; transverse fascia on corium reduced to a short oblique mark on medial vein *oppositus* (Say) (p. 123)
- Postero-lateral margins of pronotum serrate; first antennal segment bicolored with a pale inner marginal area; transverse fascia on corium complete (rarely entirely absent) 28
28. Pronotal calli with a rough surface texture, numerous dark thick hairs interspersed with pale hairs on anterior pronotal disk; male genital capsule with a rectangular median notch, no dorsal prongs (Fig. 44) *concolor* (Walker) (p. 118)
- Pronotal calli smooth, pale pilose hair only on anterior pronotal disk; male genital capsule with a rounded median notch, dorsal prongs present *stigma* (Herbst) (p. 120)
29. Dorsum piceous; all marginal areas of pronotum continuously and widely yellowish-orange; venter largely bright orange with few small piceous maculae *ashmeadi* Heidemann (p. 134)
- Dorsum dark reddish brown; pronotal disk with yellowish areas, or posterior marginal area yellow but never all margins of pronotum continuously yellow; venter tan with numerous small piceous spots 30
30. Second antennal segment entirely fuscous; pronotum with

two large diffuse yellowish-orange areas occupying most of disk and anterior half of humeral area; pronotum behind humeri dark, without contrasting pale area —

- *conspersus* Stål (p. 106)
- Second antennal segments bicolored with medial portion pale and the remaining areas dark; pronotal disk with two distinctly round spots or, the posterior disk and the area behind humeri are pale yellow ----- 31
31. Anterior portion of pronotal disk without two distinct pale round spots (Greater Antilles) — *concolor* (Walker) (p. 118)
- Anterior portion of pronotal disk with two distinct pale round spots ----- 32
32. Posterior marginal area of pronotum with a narrow yellowish band strongly contrasting with adjacent darker areas; lateral margins of pronotum nearly straight (Fig. 3) (Lesser Antilles) ----- *grenadensis* n. sp. (p. 108)
- Pronotal area behind humeri concolorous without pale areas; lateral margins of pronotum sinuate ----- 33
33. Left median lobe on dorsal sac of aedeagus long, without a secondary lobe; transverse fascia on corium, if present, narrow, confined to veins ----- *neovexillatus* n. sp. (p. 113)
- Left median lobe on dorsal sac of aedeagus blunt and with a long secondary lobe; transverse fascia rarely absent, and usually wide, on both corium and veins -----
- *zonatus* (Dallas) (p. 110)
34. Clavus and corium dark brown with strongly contrasting pale yellow or ochraceous veins ----- 35
- Clavus and corium dark, veins usually concolorous or at most bright red, but never pale yellow or ochraceous — 36
35. Pronotum with an ochraceous transverse fascia between humeri narrow, approximately width of fore femora; first antennal segment unicolorous, piceous; remaining segments bicolored with strongly contrasting pale and dark areas ----- *lineosus* (Stål) (p. 73)
- Pronotum with an ochraceous transverse fascia between humeri wide, covering most of anterior portion of disk; all antennal segments unicolorous, pale ochraceous -----
- *subauratus* Distant (p. 75)
36. Pronotal disk with a narrow arcuate pale transverse fascia; thoracic pleura with 10 to 12 pale maculae on each side; abdominal venter with six to seven complete or maculated longitudinal fasciae ----- 37
- Pronotal disk without a narrow transverse fascia, usually

- unicolorous or with round spots; thoracic pleura never with more than six yellowish maculae on each side; abdominal venter without longitudinal fasciae 38
37. Hind tibiae with outer dilations extending for 85–90% the length of tibiae (Fig. 54); abdominal dorsum with two yellowish spots on scent gland scars (Western Hemisphere) *gonagra* (Fabricius) (p. 84)
- Hind tibiae with outer dilations shorter, extending for at most 75% the length of tibiae (Figs. 52–53); abdominal dorsum unicolorous without yellowish spots (Eastern Hemisphere) *australis* (Fabricius) (p. 81)
38. Pronotum with four small yellowish spots, two on anterior disk and two on posterior marginal area; lateral margins of pronotum entire, without serrations or teeth 39
- Pronotum without spots, generally disk entirely yellow contrasting with remainder of pronotum and hemelytra; lateral margins of pronotum serrate 40
39. Outer tibial dilations small with shallow emarginations, width outer dilations equal to or slightly less than interocular distance; fore and middle tibiae unicolorous without a pale yellow annulus *harpagon* (Fabricius) (p. 68)
- Outer tibial dilations larger with deep emarginations, width outer dilations 1.5 times the interocular distance; fore and middle tibiae with a pale yellow annulus *flavosignatus* Blöte (p. 70)
40. Outer tibial dilation narrow and entire, without prominent teeth or emarginations, its width 1.0 to 1.5 times width of inner dilations; length of fourth antennal segment 1.08 to 1.2 times length of third (Fig. 2) *crassicornis* (Dallas) (p. 64)
- Outer tibial dilations wider with one or two emarginations, its width 1.8 to 2.0 times width of inner dilations; length of fourth antennal segment 1.2 to 1.8 times length of third 41
41. Thoracic pleura with a single yellow maculae occupying almost the entire ventral third of each pleuron; outer tibial dilation occupying approximately 65% length of hind tibiae *cinctus* (Herrich-Schaeffer) (p. 61)
- Pro- and mesopleura with two small yellow maculae, metapleuron with one (maculae about the size of an eye or less); outer tibial dilation occupying approximately 55% length of hind tibiae *fasciatus* (Westwood) (p. 66)

***Leptoglossus cinctus* (Herrich-Schaeffer)**

Anisoscelis cincta Herrich-Schaeffer, 1836:91, fig. 315.

Theognis cincta Mayr, 1866:103.

Leptoglossus cinctus Stål, 1870:164.—Distant, 1881:125.—Lethierry and Severin, 1894:47.—Barber and Bruner, 1947:80.—Wolcott, 1948:197.

Pronotum behind humeri, clavus, basal two thirds of corium, fore and middle legs light brown; head piceous with lateral areas and three narrow dorsal stripes light reddish brown; entire declivous face of pronotum including lateral margins straw yellow with remainder of pronotum, scutellum, veins of clavus and corium, and apical third of corium dull wine red; apex scutellum, straight transverse fascia on corium, single maculae on inner tibial dilations whitish yellow; basal areas of each thoracic pleuron with a large bright yellow macula; first antennal segments piceous with inner margins of first, entire second, third and basal half of fourth light reddish brown; distal half of fourth segment ochraceous; thoracic and abdominal hind tibiae including dilations dull to bright wine red; abdominal dorsum piceous with central portion metallic blue-green, last tergum with a large semicircular straw yellow spot; connexivum, large portions of thoracic and abdominal venter centrally, lateral areas of hind femora, femoral teeth and tubercles piceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures smooth, pronotal punctures slightly larger and farther apart; scutellum transversely rugulose with numerous punctures; thoracic pleura with numerous small patches of dense, short, appressed whitish hairs; remainder of body and appendages with sparse short erect hairs.

Head non-declivent with tylus and juga raised above level of antenniferous tubercles, tylus blunt forming a rounded elevated ridge slightly exceeding juga, length head 2.64, width head 2.28, interocular distance 1.20, anteocular distance 1.44; pronotum gradually declivent with lateral margins serrate and straight, humeral areas not expanded or ascending, humeral angles acute, postero-lateral margins serrate, calli barely elevated, area between calli slightly higher and indistinct from calli, disk posteriorly without low median longitudinal carina, length pronotum 3.04, width across humeri 5.76, width anterior margin pronotum 1.68; length scutellum 2.52, width scutellum 2.40; labium reaching to anterior margin of third abdominal sternum, length labial segments I 2.76, II 2.52, III 1.32, IV 2.28; length antennal segments I 2.64, II 3.84, III 2.64, IV 4.32; hind tibiae with

outer dilations lanceolate with one extremely shallow emargination, occupying 66% length of hind tibiae, width about twice that of inner dilations; inner dilations lanceolate, slightly shorter than outer with numerous small spine-like teeth along entire margins; inner margins of undilated portions of hind tibiae with a double row of small spine-like teeth, length hind tibiae 9.84; length outer dilations 6.48, width outer dilations 1.80; length inner dilations 5.32, width inner dilations 0.84; total length 19.1.

Claspers (Fig. 6) with inner basal lobe broad, long, and rounded; shank thick without a median lobe, hook strongly curved; capsule (Fig. 31) with a simple deep and rounded median notch, no dorsal prongs; aedeagus (Fig. 64) with dorsal sac of conjunctiva as follows: long proximal lobes present; two pairs of median lobes present, one pair lower and laterally situated with tips barely sclerotized, other pair medially and apically situated and heavily sclerotized and spinose; distal lobes present as two broad lateral extensions of sac, unsclerotized.

The description is of a male specimen from Chapada, Brazil. All of the specimens from Cuba, Mexico, and Central America have the transverse fascia on the corium absent or reduced to a short and faint narrow mark. Also Cuban specimens have a dark brownish yellow to light brown pronotal disk, thereby giving the appearance of an almost concolorous dorsum. The above color patterns also occur in a few South American specimens. The labium varies in length extending from the anterior margin of the second to the anterior margin of the fourth abdominal sternum.

L. cinctus may be distinguished from the closely related species *fasciatus* and *crassicornis* by the following characters: outer tibial dilations broader, almost twice the width of those of *crassicornis* and longer than the outer dilations on *fasciatus*; the yellow maculae on the thoracic pleura are larger, occupying almost the entire ventral third of each pleuron; the dorsal sac of the aedeagus has the more distally placed pair of median lobes heavily sclerotized and spinose.

L. cinctus has been collected on guava fruit and *Byrsonia crassifolia* H.B.K. (Barber and Bruner, 1947), and on cactus species of the genera *Cereus* and *Opuntia* (Mann, 1969).

Distribution: A widely distributed species occurring in southern Mexico, Cuba, through Central America and most of South America.

Material Examined: MEXICO: 1 ♀, Rosamorada, Nayarit, VIII-4-1953, D. Rockefeller Mex. Exp. 1953 (C. & P. Vaurie); 1 ♀, La-Buena Ventura, Vera Cruz, 7-1909; 1 ♀, no data; 1 ♀, 10 mi. SE

Tapanatepec Oax., VIII-8-1963 (F. D. Parker, L. A. Stange); 1 ♀, 24 mi. west Cintalapa, Chis., VIII-12-1963 (F. D. Parker, L. A. Stange). CUBA: 2 ♂, 1 ♀, 14 K. N. of Vinales, Sept. 16-22, 1913; 1 ♂, same except 7 K. N. of Vinales; 1 ♀, same except 24 K. N. of Vinales; 1 ♂, Cayamas (E. A. Schwarz); 1 ♀, Havana (F. Z. Cervera). HONDURAS: 1 ♀, Dept. Morazan Esc. Agr. Pan., Zamorano, 2700 ft. (ocotal), July 2, 1948 (T. H. Hubbell 146); 1 ♀, same except 2600 ft. (llano), July 26, 1948; 2 ♀, Minas de Oro, Comay, 1-VI (4000 ft.) (J. B. Edwards); 1 ♂, Subirana Yoro, Jan. (Stadelmann); 1 ♀, same except 18-11; 1 ♀, La Ceiba I. de P., Sept. 1938 (Ent. No. 11014), "taken on Peralejo"; 1 ♂, Zamorano, IX-1953, "on guava fruit" (N. L. H. Krauss). COSTA RICA: 1 ♀, Pacayas (C. Werckele). PANAMA: 1 ♂, Amer. centr. Chiriqui. BRITISH GUIANA: 1 ♀, E. C. Demerara, Pln. Hope, 29-VI-1932 (F. A. Squire). FRENCH GUIANA: 1 ♂, Cayenne, 4-VIII-1954 (N. L. H. Krauss); 1 ♂, no data. VENEZUELA: 1 ♂, Merida. COLOMBIA: 1 ♂, 2 ♀, Bogota (Lindig); 1 ♀, Lake Sapatoza region, Chiriguana District, VIII-XI-1924 (C. Allen). PERU: 1 ♀, Vilcanota. BOLIVIA: 1 ♀, Rio Ivon Beni, February, Mulford Bio Expl. 1921-22 (W. M. Mann); 1 ♂, Prov. del Sara, CM Acc 5068, April 1913 (Steinbach); 1 ♀, Coroico; 1 ♂, Prov. Sara (Steinbach); 1 ♀, no data. BRAZIL: 1 ♂, 1 ♀, Chapada (2600 ft.) Nov. 1902 (A. Robert), 1903-96; 1 ♂, Chapada, Acc. No. 2966; 1 ♂, 1 ♀, Chapada, Acc. No. 2966, August; 2 ♀, same except June; 5 ♂, same except September; 1 ♂, 3 ♀, same except January; 3 ♀, same except April; 5 ♂, 1 ♀, same except March; 1 ♂, 4 ♀, same except May; 3 ♂, 5 ♀, same except November; 2 ♂, 4 ♀, same except December; 2 ♂, 3 ♀, same except October; 1 ♂, 1 ♀, Chapada Campo, Oct.; 1 ♀, Corumba, Acc. No. 2966, June; 1 ♂, 2 ♀, S. Paulo; 1 ♂, Amazon (Stevens); 1 ♂, 1 ♀, Brasilia bor.; 1 ♂, Cuyaba, Matto-Grosso; 1 ♂, Minas geraes Ouropreto, 26-12-1898; 1 ♀, Annapolla, Goiaz, XI-24-1936 (G. Fairchild); 1 ♀, Corumba, Matto-Grosso, 1950 (H. G. Barber); 1 ♂, Para (P. R. Uhler collection); 1 ♂, Corumba, Feb. PARAGUAY: 1 ♂, Asuncion, Sept. 1922-April 1923 (E. G. Kent), BM 1925-262. ARGENTINA: 1 ♂, Puerto Aguirre, Alto Parana, 11-21-III-1-1934 (K. J. Hayward), BM 1934-337; 1 ♀, Mendoza (H. Rolle, Berlin W.). In United States National Museum (J. C. Lutz coll.), American Museum of Natural History, Stockholm Museum, Museum of Comparative Zoology (Harvard University), Hungarian National Museum, British Museum (Natural History), Carnegie Museum, Berlin Humboldt University Museum, University of Kansas, J. A. Slater and R. C. Allen collections.

Leptoglossus crassicornis (Dallas)

(Fig. 2)

Anisoscelis crassicornis Dallas, 1852:454.*Leptoglossus crassicornis* Stål, 1870:164.—Lethierry and Severin, 1894:47.

Pronotum behind humeri, clavus and basal two thirds of corium fuscous; head piceous; declivous face of pronotum straw yellow with anterior margins including calli, lateral margins widely and a rather broad median longitudinal band diminishing posteriorly to opposite humeral angles bright red; head piceous; following areas bright red: head laterally, dorsally with three narrow stripes, first three antennal segments entirely, scutellum, veins of clavus and corium, and apical third of corium; transverse fascia on corium straight, abbreviated not surpassing medio-cubital crossveins laterally, apex scutellum, inner tibial dilations with a single maculae whitish yellow; ventral area of pro- and mesopleura with two and metapleura with one large maculae bright yellow; fore and middle legs, undilated portion of hind tibiae, and punctation on pronotal disk light brown to ochraceous; hind femora and tibial dilations dark reddish brown to fuscous with teeth and tubercles piceous; thoracic and abdominal venter variegated bright red and fuscous; connexivum and abdominal dorsum piceous with anterior portions of connexival segments and last abdominal tergum with a single large rounded spot whitish yellow; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures smooth, pronotal punctations slightly larger and farther apart; scutellum transversely rugulose with few punctures; body moderately and appendages more densely covered with short erect, semi-decumbent pale hairs.

Head non-declivent, both tylus and juga raised above level of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge slightly exceeding juga, length head 2.76, width head 2.40, interocular distance 1.20, anteocular distance 1.44; pronotum gradually declivent, lateral margins straight with few extremely small teeth, almost entire, humeral areas not expanded or ascending, humeral angles acute, postero-lateral margins entire, calli barely elevated, area between calli slightly higher and indistinct from calli, disk posteriorly with the low median longitudinal carina obsolete, length pronotum 3.04, width across humeri 5.60, width anterior margin of pronotum 1.68; length scutellum 2.16, width scutellum 2.28; labium reaching to middle of fifth abdominal sternum, length labial segments I 3.60, II 3.48, III 1.80, IV 3.72; length antennal segments I 2.76, II 5.28, III 2.88, IV missing; hind tibiae with outer dilations lanceolate,

entire, occupying 71% length of hind tibiae, very narrow, about 1.2 times width of inner dilations; inner dilations lanceolate, slightly shorter than outer, with numerous small spine-like teeth along margins; inner margins of undilated portions with a double row, dorsal margins for entire length of hind tibiae with a single row of numerous small spine-like teeth, length hind tibiae 10.1; length outer dilations 7.20, width outer dilations 0.72; length inner dilations 6.00, width inner dilations 0.60.

Claspers and capsule as in *cinctus*; aedeagus with dorsal sac of conjunctiva as follows: without proximal lobes; two pairs of median lobes present, one pair lower and laterally situated with a small lobe arising from bases of each and tips barely sclerotized, the other pair medially and apically situated, unsclerotized; distal lobes present as two broad lateral extensions of sac, unsclerotized; dorso-lateral appendage appressed to wall of conjunctiva; total length 17.6.

The above description is of the male holotype. Unfortunately, the fourth antennal segments are missing, but Dallas (1852) stated that the second segment was as long as the third and fourth combined, and the fourth was as long as the third; and that the fourth segment was pale brown with the apex yellow.

I have tentatively identified a large series of specimens from South America as *crassicornis* primarily on the basis of identical hind tibial dilations, the close similarity of the genitalia, and the shortness of the fourth antennal segments. The following are differences exhibited in the series from the holotype: the pronotal lateral margins are generally prominently serrate, although a few individuals do approach the condition found in the type; the combined length of antennal segments three and four is about 1.5 times the length of the second, and length of the fourth antennal segment is 1.08 to 1.20 times that of the third; the humeral angles are not so acute; there are no traces of red on the lateral margins or centrally as a longitudinal band on the pronotum, nor are any of the red areas present as bright as are those on the holotype. Due to the lack of specimens from Bolivia northward to Colombia (the type locality), I do not feel justified in establishing a new species for the southern population at this time. This population has in the past been confused with *fasciatus*.

L. crassicornis may be distinguished from both *cinctus* and *fasciatus* by the narrower tibial dilations and the shorter fourth antennal segments. The aedeagal differences are: from *cinctus*, the absence of proximal lobes and unsclerotized medial lobes; and from *fasciatus*, the close appression of the dorso-lateral appendage to the wall of the conjunctiva.

Distribution: Bolivia, Uruguay, Paraguay, and Argentina. The only Colombian record is of the male holotype.

Material Examined: Holotype: ♂. COLOMBIA. In the British Museum (Natural History). BOLIVIA: 1 ♂, Cochabamba, III-25-1950 (L. Pena); 1 ♂, N.E. Cochabamba, II-24-1950 (L. Pena). URUGUAY: 1 ♀, Pinapolis, I-25 (Doot). PARAGUAY: 1 ♂, no data (Berg). ARGENTINA: 3 ♂, 2 ♀, Cordoba (W. M. Davis); 1 ♂, Chilecito, La Rioja; 1 ♂, Campo del Cielo, I-1934 (J. M. Bosq); 2 ♂, Poso Moza, Formosa, 2-2-1937 (Denier); 1 ♂, 1 ♀, Ing. Juarez, Formosa, 18-V-1939 (Denier); 4 ♂, 1 ♀, Sgo. del Estero, Rio Salado (Wagner); 4 ♂, 1 ♀, Andalgalá, Catamarca, 3-III-1939 (Biraben-Scott); 1 ♂, same except 23-III-1939; 1 ♀, Hualfin, Catamarca 5-III-1939 (Biraben-Scott); 3 ♂, 3 ♀, Mendoza; 1 ♀, same except (Berg); 1 ♂, 1 ♀, Mendoza Parque, III-1940 (J. M. Bosq). In United States National Museum, La Plata Museum, Museum of Comparative Zoology (Harvard), J. A. Slater and R. C. Allen collections.

***Leptoglossus fasciatus* (Westwood)**

Anisoscelis fasciata Westwood, 1842:17.

Theognis fasciatus Mayr, 1866:102.

Leptoglossus fasciatus Stål, 1870:164.—Lethierry and Severin, 1894:47.

Pronotum, scutellum, clavus and corium fuscous; head piceous with lateral areas and above with three narrow stripes light reddish brown; entire declivous face of pronotum, antennae, fore and middle legs, and undilated portion of hind tibiae straw yellow to ochraceous; veins of clavus and corium, and apical third of corium dull wine red; basal portion of third antennal segment, apex scutellum, straight transverse fascia on corium, and a single maculae on inner tibial dilations whitish yellow; pro- and mesopleura with two and metapleuron with one bright yellow maculae; hind femora and tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter variegated dark reddish brown and fuscous; connexivum and abdominal dorsum piceous with a slight tinge of metallic green around scent gland scars; anterior portion of connexival segment and a semi-circular spot on last abdominal tergum whitish yellow; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures smooth, with pronotal punctures slightly larger and farther apart; scutellum transversely rugulose with numerous punctures; body and appendages with moderate amounts of short erect and appressed pale hairs.

Head non-declivent with both tylus and juga raised above level

of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge slightly exceeding juga, length head 2.64, width head 2.16, interocular distance 1.20, anetocular distance 1.44; pronotum gradually declivent, lateral margins straight and prominently serrate, humeral areas not expanded and barely ascending, humeral angles subspinose, postero-lateral margins serrate, calli barely elevated, area between calli slightly higher with two low tubercles, disk posteriorly with low median longitudinal carina absent; length pronotum 2.72, width across humeri 5.44, width anterior margin pronotum 1.68; length scutellum 1.92, width scutellum 2.04; labium reaching to posterior margin of fourth abdominal sternum, length labial segments I 3.36, II 3.16, III 1.68, IV 3.00; length antennal segments I 2.76, II 5.04, III 3.24, IV 4.08; hind tibiae with outer dilations lanceolate with two very shallow emarginations, occupying 55% length of hind tibiae, width about twice that of inner dilations; inner dilations lanceolate, slightly shorter than outer, with numerous small spine-like teeth along margins; inner margins of undilated portion with a double row and dorsal margin for the entire length of hind tibiae with a single row of numerous small spine-like teeth, length hind tibiae 10.8; length outer dilations 6.00, width outer dilations 1.20; length inner dilations 4.80; width inner dilations 0.60.

Claspers and capsule as in *cinctus*; aedeagus with dorsal sac of conjunctiva as follows: without proximal lobes; two pairs of median lobes present, one pair lower and laterally situated with a small lobe arising from the bases of each, tips barely sclerotized, the other pair medially and apically situated and unsclerotized; distal lobes present as two broad lateral extensions of sac and unsclerotized; dorso-lateral appendage of conjunctiva more lobate and not closely appressed to wall of conjunctiva, extending posteriorly; total length 16.0.

I have determined the material at hand on the basis of drawings and comparative notes of the holotype which were made possible through the kindness of Dr. I. Lansbury of the University of Oxford Museum. The description is of a male specimen from Macahe, Brazil.

The longer and more acute humeral angles and shorter tibial dilations will distinguish *fasciatus* from both *crassicornis* and *cinctus*. From *cinctus*, *fasciatus* is further distinguished by the generally longer labium, dark reddish brown to fuscous dorsum, smaller maculae on the thoracic pleura and the absence of a heavily sclerotized spinose medial lobe on the dorsal sac of the aedeagus. Additional characters that further separate *fasciatus* from *crassicornis* are: the longer fourth antennal segments, 1.3 to 1.4 times the length of the

third and the large lobate dorso-lateral appendage extending from the conjunctiva.

Bosq (1940) reported *fasciatus* common on *Baccharis* and as feeding on cactus, although these host plant records from Argentina probably pertain to the southern population of *crassicornis*. In the material examined, there are three males from Macahe, Brazil, that were collected on cactus fruits.

Distribution: The recorded distribution includes Argentina, but I believe this to be based on misidentified specimens of *crassicornis*. In a large series of *Leptoglossus* species from the La Plata Museum, there was not a single specimen of *fasciatus*. So far, I have seen only five specimens, all from Brazil.

Material Examined: BRAZIL: 3 ♂, Macahe, Dec., 1928, "on cactus fruit" (E. Mortensen); 1 ♀, 1905-100 (Fry); 1 ♀, Rio de Jan., Nov, Acc. No. 2966. In the Carnegie Museum, British Museum (Natural History), and United States National Museum.

***Leptoglossus harpagon* (Fabricius)**

Cimex harpagon Fabricius, 1775:101.

Cimex harpator Gmelin, 1788:2188.

Lygaeus harpagon Fabricius, 1794:146.

Anisoscelis sexmaculata Stål, 1859:458.

Theognis erythrinus Mayr, 1865:434.—Mayr, 1866:105, fig. 24.

Leptoglossus harpagon Stål, 1870:165.—Lethierry and Severin, 1894:47.—Blöte, 1936:28.

Head, pronotum, scutellum, clavus and corium uniformly dark reddish brown with two wide piceous stripes on head; pronotal disk anteriorly, submarginal area of posterior pronotal lobe and medio-cubital crossvein area of corium each with two dark to whitish yellow round spots; apex scutellum whitish yellow; antennal segments, legs including tibial dilations dark reddish brown, the latter with teeth and tubercles piceous; thoracic pleura dark reddish brown with the following large shining orange yellow maculae: each pleuron with one distinct but poorly defined macula above coxal cavity, propleura with two maculae on posterior marginal area, mesopleura with one dorsal spot on posterior margin; abdominal venter light to dark ochraceous; connexivum and abdominal dorsum piceous with margins and anterior third of each connexival segment and two round spots on scent gland scars yellowish orange; membrane uniformly dark; pronotum coarsely and closely punctate, surface above punctations uneven; clavus and corium closely and more finely punctate; scutellum transversely rugulose with few punctures; body and appendages moderately

covered with short appressed and erect pale hairs, head below and thoracic mid-venter densely covered with thicker grayish hairs.

Head non-declivent with both tylus and juga raised slightly above level of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge slightly exceeding juga, length head 2.04, width head 2.16, interocular distance 1.08, anteocular distance 1.08; pronotum gradually declivent with lateral margins slightly sinuate and entire, humeral areas not expanded or ascending, humeral angles subacute, postero-lateral margins entire, posterior pronotal disk with an obvious low median longitudinal carina, pronotal calli prominently elevated, raised area between calli with two obscure small tubercles, length pronotum 2.24, width across humeri 4.16, width anterior margin pronotum 1.56; length scutellum 1.92, width scutellum 1.68; labium extending to posterior margin of third abdominal sternum, length labial segments I 2.04, II 1.92, III 1.20, IV 2.04; length antennal segments I 1.56, II 2.88, III 2.16, IV 3.24; hind tibiae with outer dilations slightly phylliform with two shallow emarginations, occupying 67% length of hind tibiae, and about one and a half times width of inner dilations; the latter lanceolate, slightly shorter than outer dilations and armed with a few small spine-like teeth; inner margins of undilated portion of hind tibiae without small spine-like teeth, length hind tibiae 5.76; length outer dilations 3.84, width outer dilations 0.84; length inner dilations 3.24, width inner dilations 0.60; total length 13.9.

The above description is based on the female holotype of *L. sexmaculatus* (Stål). The Fabricius type of *harpagon* was not seen. The following description of genitalia is of a male specimen from Corupa, S. Cath. Brazil.

Claspers (Fig. 7) with inner basal lobe very low; hook and shank not differentiated but forming a scooped out blade which curves inward rather sharply at tip; capsule (Fig. 32) with deep median notch and strong dorsal prongs, entire posterior edge greatly produced backwards over curvature of capsule; aedeagus (Fig. 65) with dorsal sac of conjunctiva as follows: three large unsclerotized proximal lobes; medial portion of sac without lobes; distal end of sac with a large blunt posteriorly directed area and two smaller antero-lateral lobes, all unsclerotized.

I have based the description of *harpagon* on Stål's *sexmaculatus* which he himself synonymized. Stål also synonymized Mayr's *erythrinus*, the description of which resembles in every respect Blöte's *flavosignatus*. At present, I feel it is best to treat Blöte's species as valid until both the type of *harpagon* and *erythrinus* can be examined.

Unfortunately, I was unable to associate any male specimens with *flavosignatus* so that the differentiation of these two species is based

only on females. I have before me a number of individuals which are related closely to these species, but possess a number of differentiating characters, especially in the shape of the tibial dilation and the male genitalia. I do not feel it desirable to describe additional species until a larger series of specimens can be definitely associated with the types, in order to evaluate correctly any variation.

The two species may be separated by the following characters: *harpagon* has a smaller tibial dilation, the width being slightly less than, or equal to, the interocular distance, in *flavosignatus* the width of the outer dilation is at least 1.5 times the interocular distance; the fore and middle tibiae have a pale yellow annulus and the dorsum has light and dark areas in *flavosignatus*, while in *harpagon* both the tibiae and dorsum are unicolorous. There is also considerable difference in the size and shape of the corial spots and in overall size between these two species.

Distribution: Brazil.

Material Examined: Holotype, ♀ of *L. sexmaculatus*, Stål. In Stockholm Museum. BRAZIL: 1 ♂, Parana, 1905-163 (E. D. Jones); 1 ♂, Corupa, S. Cath., Nov. 1948 (A. Maller). In British Museum (Natural History) and American Museum of Natural History.

***Leptoglossus flavosignatus* Blöte**

Leptoglossus flavosignatus Blöte, 1936:28.

Pronotum, scutellum, clavus and corium dark reddish-brown and fuscous with humeri and posterior submargin of pronotum entirely fuscous; head above and below piceous; pronotal disk with two large longitudinally ovoid spots, submarginal area with two smaller transversely ovoid spots, corium with two large somewhat rectangular spots bright yellowish orange; head striped laterally and with three short narrow stripes above; apex scutellum, median annulus on fore and middle tibiae, undilated portion of hind tibiae, and maculae on inner tibial dilation whitish yellow to ochraceous; all antennal segments, fore and middle legs, basal three fourths and ventral portion of hind femora light to dark reddish brown; tibial dilations and distal portion of hind femora fuscous with teeth and tubercles piceous; thoracic pleura dark reddish brown, with following areas having large strongly contrasting bright yellowish orange spots: each pleuron with one spot above coxal cavity, propleuron with two spots on posterior marginal area, mesopleuron with one dorsal spot; abdominal venter variegated castaneous to fuscous with anterior lateral margins of each sterna whitish yellow; connexivum and abdominal dorsum piceous with anterior half of each connexival segment and a round

spot on each scent gland scar whitish yellow; membrane uniformly dark; pronotum coarsely and closely punctate, surface above punctation uneven; clavus and corium closely and more finely punctate; scutellum transversely rugulose and densely punctate, venter densely clothed with short appressed thick grayish hairs; dorsum and appendages with short, and hind tibiae with longer, erect pale hairs.

Head before eyes slightly declivent with tylus and juga barely below level of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge, slightly exceeding juga, length head 2.40, width head 2.52, interocular distance 1.20, anteocular distance 1.20; pronotum abruptly declivent with disk tumid laterally, forming a noticeable wide trough medially, lateral margin entire and strongly sinuate, humeral areas barely expanded with humeral angles acute and not ascending, postero-lateral margins entire, the median low longitudinal carina on disk prominent, calli highly raised and area between calli with two low tubercles, length pronotum 3.20, width across humeri 5.60, width anterior margin pronotum 2.04; length scutellum 2.52, width scutellum 2.40; labium extending to posterior margin of third abdominal sternum, length labial segments I 2.64, II 2.40, III 1.32, IV 2.52; length antennal segments I 2.40, II 4.08, III 3.00, IV 4.80; hind tibiae with outer dilations phylliform with two deep emarginations, occupying 68% length of hind tibiae, width outer dilations slightly less than twice that of inner dilations; inner dilations lanceolate slightly shorter than outer dilations with distal margins possessing a few small spine-like teeth; inner marginal area of undilated portion of hind tibiae without small spine-like teeth; length hind tibiae 9.00; length outer dilations 6.12, width outer dilations 2.04; length inner dilations 5.76, width inner dilations 1.2; total length 17.9.

For diagnostic characters see discussion under *harpagon*.

Distribution: The holotype is without locality data, but the one additional specimen examined is from Peru.

Material Examined: Holotype: ♀, Cat. No. 7. In Leiden Museum. 1 ♀, Marcapata, Peru. In Hungarian National Museum.

***Leptoglossus alatus* (Walker)**

(Fig. 5)

Anisoscelis alatus Walker, 1871:129.

Leptoglossus alatus Lethierry and Severin, 1894:46.

Medial posterior area of pronotum, most of scutellum, clavus and corium dull black with following parts metallic purple blue: head above, all antennal segments, anterior portion of pronotum including

calli, lateral basal areas of scutellum, punctations on dark areas of dorsum, all legs and tibial dilations; pronotum with a large continuous, sharply defined orange band occupying following areas: entire pronotal disk including caudo-lateral margins and entire humeral area, this orange area interrupted by numerous small piceous spots; entire head below and three narrow stripes above, a large macula occupying most of outer tibial dilations and corium with two rounded spots on medio-cubital cross-vein ochraceous to orange tan; entire thoracic and abdominal venter orange tan with following strongly contrasting dark markings: large spot on antero-dorsal area of pro- and metapleura and a large spot above metacoxal cavities metallic purplish black, a few scattered small piceous spots on remainder of pleura; abdominal venter with four rows of large piceous maculae, two rows dorso-laterally situated, two rows lateral to mid-line; connexivum and abdominal dorsum piceous with anterior half of each connexival segment, anterior and lateral portions of abdominal dorsum orange to orange tan; membrane uniformly dark; pronotum, clavus and corium regularly and closely punctate, surface above punctures largely smooth; pronotal punctures posteriorly slightly larger and deeper than elsewhere; scutellum transversely rugulose with a few small punctures; entire venter and dorsum with very sparse short erect hairs; scutellum with more dense, longer, pilose hairs; appendages with dark thicker and long hairs.

Head with anteocular portion slightly declivent, tylus and juga below level of antenniferous tubercles, tylus blunt, slightly exceeding juga and barely elevated, length head 3.00, width head 2.76, interocular distance 1.44, anteocular distance 1.68; pronotum steeply declivent with lateral margins conspicuously dentate for entire length, humeral areas greatly expanded into large anteriorly curving and obliquely ascending processes, humeral angles acuminate, postero-lateral margins conspicuously dentate, calli prominently elevated, area between calli only slightly higher with two small tubercles, disk posteriorly with median longitudinal carina obsolete; length pronotum 3.84, width across humeri 9.6, width anterior margin pronotum 2.04; length scutellum 3.12, width scutellum 3.24; labium reaching posterior margin of fourth abdominal sternum, length labial segments I 3.36, II 3.12, III 1.92, IV 4.32; length antennal segments I 3.12, II 4.80, III 3.60, IV missing; hind tibiae with outer dilations almost lanceolate with one very shallow emargination, occupying 57% length of hind tibiae, outer dilations a little wider than inner dilations; inner dilations lanceolate, slightly shorter than outer, furnished with a few small spine-like teeth distally; undilated portions of hind tibiae without teeth, length hind tibiae 9.36; length outer dilations 5.40, width outer

dilations 1.20; length inner dilations 4.80, width inner dilations 0.84; total length 22.0.

L. alatus is a unique species and easily identified by the shape of the humeral expansions, the orange pronotal band and the orange-tan venter that contrasts strongly with the metallic purple-blue and black of the rest of the body. The placement of *alatus* with or near any species or species groups is difficult without a male specimen. A few characters do seem to relate *alatus* to *lineosus* and *subauratus*. These are: declivous condition of the head; shape of the tibial dilations; surface texture; amount of pubescence on the body.

Distribution: Brazil.

Material Examined: Holotype: ♀, "Para," Brazil. In British Museum (Natural History).

***Leptoglossus lineosus* (Stål)**

Theognis lineosus Stål, 1862:295.

Leptoglossus lineosus Stål, 1870:164.—Distant, 1881:126, pl. 12, fig. 17.—Lethierry and Severin, 1894:48.

Pronotum, clavus and corium chocolate brown with head, first antennal segment, pronotal calli, and scutellum piceous; dorsum with strongly contrasting whitish yellow to ochraceous markings as follows: head laterally and with three narrow stripes above, all margins of pronotum, a median longitudinal stripe from collar to a transverse humeral fascia, and a pair of posteriorly tapering rays from calli well onto disk on either side of midline, tubercles on raised area between calli, a narrow median longitudinal stripe on scutellum, narrow straight transverse fascia on corium, very narrowly along claval commissure, all veins on clavus and corium except anterior half of radius; basal three fourths of antennal segments two, three and apex of fourth, fore, middle, undilated portions of hind tibiae, and bases of femora light reddish tan; all femora and hind tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter fuscous to piceous with the following areas strongly contrasting ochraceous to light tan: all marginal areas of propleuron, area above coxal cavities, posterior margins of meso- and metapleura, two well defined longitudinal stripes across thoracic pleura, posterior and lateral marginal areas of abdominal venter, large maculae surrounding spiracular openings and the maculae on inner tibial dilations light reddish tan; connexivum and abdominal dorsum piceous with anterior third of connexival segments ochraceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctations largely smooth; scutellum transversely rugulose and

impunctate; body with sparse short erect and semi-decumbent hairs; femora with more dense appressed pubescence.

Head before eyes declivent, tylus and juga below level of antenniferous tubercles, tylus blunt, slightly exceeding juga and barely elevated, length head 2.28, width head 2.16, interocular distance 1.08, anteocular distance 1.20; pronotum gradually declivent with lateral margins entire and straight, humeral areas not greatly expanded with humeral angles prominent and acuminate, obliquely ascending, postero-lateral margins entire, pronotal disk with a prominent low median longitudinal carina, calli slightly elevated, area between calli with two small tubercles, length pronotum 2.88, width across humeri 5.60, width anterior margin pronotum 1.80; length scutellum 2.04, width scutellum 2.16; labium extending to posterior margin of third abdominal sternum, length labial segments I 2.52, II 2.64, III 0.96, IV 2.64; length antennal segments I 2.40, II 3.84, III 2.28, IV 3.48; hind femora greatly incrassate; hind tibiae with outer dilations lanceolate, occupying 65% the length of hind tibiae, of same width as inner dilations; inner dilations lanceolate, as long as outer dilations, distally with a few strong teeth along margins; undilated portion of hind tibiae along inner margins with a double row of spine-like teeth, length hind tibiae 7.20; length outer dilations 4.68, width outer dilations 0.96; length inner dilations 4.68, width inner dilations 0.96.

Claspers (Fig. 8) with base and shank little differentiated from each other, no lobes present; shank very wide in lateral view and scooped out medially, hook strongly curved dorsally; capsule (Fig. 33) with a shallow median notch, no dorsal prongs, entire posterior edge gradually produced backwards over curvature of capsule; aedeagus with dorsal sac of conjunctiva divided into main lobes with low broad sclerotized proximal lobes, dorso-lateral appendage long blade-like and heavily sclerotized. Total length 17.3.

For diagnostic characters see key and discussion under *subauratus*.

L. lineosus and *subauratus* are closely related species and very distinct from the other members of the genus. They have in common, together with *harpagon* and *flavosignatus*, the following characters: claspers with a deeply scooped out shank; capsule with entire posterior edge projecting backwards over curvature of dorsal portion; a long sclerotized dorsal lateral appendage on conjunctiva.

Distribution: Mexico.

Material Examined: 3 syntypes: 1 ♂, 2 ♀, MEXICO (Sallé). In Stockholm Museum. The ♂ specimen (described above) bearing the label "TYPUS" is selected as LECTOTYPE, and an appropriate label has been attached to the specimen. MEXICO: 1 ♀, Cuernavaca Mor; 1 ♀, Tamazunchale, San Luis Potosi, V-20-1952 (M. Cazier, W.

Gertsch, R. Scharammel); 1 ♂ (Sallé). In American Museum of Natural History.

***Leptoglossus subauratus* Distant**

Leptoglossus subauratus Distant, 1881:126, pl. 12, fig. 18.—Lethierry and Severin, 1894:49.

Pronotum, scutellum, clavus and corium dark chocolate brown with head piceous; dorsum with following areas strongly contrasting whitish yellow to ochraceous: head laterally and with three narrow stripes above, all margins of pronotum, with a large crescentic macula on pronotal disc, lateral margins and a central longitudinal stripe on scutellum, lateral margins of corium, claval sutures and all veins on clavus and corium and the narrow straight transverse fascia on corium; dorsum of femora and tibiae on fore and middle legs, undilated portion of hind tibiae, maculae on inner tibial dilations, and all antennal segments light to dark tan; the latter with distal portion of segments two and three and base of four somewhat darker; hind femora and tibial dilations dark brown to fuscous with teeth and tubercles slightly darker; thoracic and abdominal venter dark brown with following areas strongly contrasting ochraceous to tan: all marginal areas of propleuron, ventral and posterior margins of meso- and metapleura, two well defined longitudinal vittae across thoracic pleura and posterior and lateral marginal area of abdominal venter; connexivum and abdominal dorsum dark brown to piceous with anterior third of each connexival segment ochraceous; membrane uniformly dark; pronotum, clavus and corium closely and finely punctate with surface above punctures smooth; scutellum transversely rugulose and impunctate; venter with sparse short appressed pale hairs; dorsum with short erect and semi-decumbent pale hairs; appendages with longer more dense pilose hairs.

Head before eyes declivent with tylus and juga below level of antenniferous tubercles, tylus blunt, slightly exceeding juga and barely elevated, length head 2.40, width head 2.04, interocular distance 1.20, anteocular distance 1.44; pronotum gradually declivent with lateral margins entire and straight, humeral areas not greatly expanded or ascending, humeral angles acute, postero-lateral margins serrate, disk with median longitudinal carina obsolete, calli slightly elevated, area between calli higher and with two low tubercles, length pronotum 2.56, width across humeri 5.12, width anterior margin of pronotum 1.56; length scutellum 1.92, width scutellum 1.92; labium extending to posterior margin of fifth abdominal sternum, length labial segments I 2.88, II 2.88, III 1.32, IV 3.24; length antennal segments

I 2.40, II 4.44, III 2.88, IV 3.84; hind femora strongly incrassate; hind tibiae with outer dilations lanceolate and occupying 60% the length of hind tibiae, width of outer dilations about equal to width of inner dilations; inner dilations lanceolate with a few large teeth distally and about equal in length to outer dilations; undilated portion of hind tibiae with a double row of small spine-like teeth along inner margins, length hind tibiae 7.80; length outer dilations 0.96; length inner dilations 4.32, width inner dilations 1.08.

Genitalia as in *lineosus* but aedeagus without proximal lobes on dorsal sac, dorso-lateral appendage with only tip barely sclerotized; total length 16.0.

The description is of a male specimen from Quezaltepeque, El Salvador. *L. subauratus* resembles *lineosus* very closely except for the following differences. The pronotum has the transverse band occupying most of the anterior portion of the disk in *subauratus* whereas in *lineosus* it is a very narrow band between the humeri. *L. subauratus* has more unicolorous antennal segments, in *lineosus* there are strongly contrasting light and dark areas. The postero-lateral margins of the pronotum are serrate and the humeral angles are acute in *subauratus*, whereas in *lineosus* the pronotal postero-lateral margins are entire with the humeral angles acuminate. Aedeagal differences are: for *subauratus* the lack of proximal lobes on the dorsal sac and a shorter less sclerotized dorso-lateral appendage; for *lineosus* the proximal lobes are present and the dorso-lateral appendage is heavily sclerotized and longer.

It should be mentioned that despite the differences listed above, these two species are very closely related. The material examined is insufficient to assess any variation which may be present. Additional collecting may prove these two species to be conspecific.

Adult specimens of *subauratus* have been collected on prickly pear in Guatemala and El Salvador (Mann, 1969).

Distribution: El Salvador. Distant (1881) lists his type series from Guatemala and Nicaragua (deposited in the British Museum).

Material Examined: EL SALVADOR: 1 ♀, Quezaltepeque, VI-24-1961 (M. E. Irwin); 1 ♀, Acajutla, 28.8 (Fred K. Knab); 1 ♂, Metapan, 5-VII-1954, No. 444-34DB (M. S. V.). In United States National Museum and University of California (Davis).

***Leptoglossus rubrescens* (Walker)**

Malvana rubrescens Walker, 1871:134.—Lethierry and Severin, 1894:51.

Leptoglossus rubrescens Distant, 1901b:417-8.

Head, pronotum, scutellum, clavus, corium and thoracic pleura dark reddish brown; veins of clavus and corium wine red; fore and middle legs and apex scutellum ochraceous to tan; abdominal venter rusty reddish brown; connexivum and abdominal dorsum fuscous with a percurrent longitudinal median stripe the width of scent gland scars pale yellow; membrane uniformly dark; pronotum coarsely and closely punctate with surface above punctations scabrous, punctations on pronotum deeper and larger than elsewhere; clavus and corium finely and closely punctate; scutellum transversely rugulose with numerous punctations; head and thoracic pleura thickly clothed with short appressed whitish pubescence; remainder of body and appendages with sparse short erect and semi-decumbent whitish hairs.

Head porrect with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 2.76, width head 2.40, interocular distance 1.20, anteocular distance 1.44; pronotum steeply declivent almost vertical with lateral margins strongly sinuate and dentate caudally, humeral areas broadly expanded into long tapering projections with humeral angles acute, postero-lateral margins strongly dentate, calli elevated and area between calli only slightly higher, disk posteriorly with the low median longitudinal carina obsolete, length pronotum 3.04, width across humeri 8.00, width anterior margin pronotum 1.68; length scutellum 2.28, width scutellum 2.28; labium reaching to posterior margin of fourth abdominal sternum, length labial segments I 3.12, II 3.12, III 1.92, IV 4.08; length antennal segments I 2.52, II 4.68, III 3.48, IV 5.64; hind legs missing.

Clasper (Fig. 11) with inner basal lobe low and rounded, shank thick without a median lobe, hook completely curved around and directed laterally; capsule (Fig. 36) with median notch deep and rounded, no dorsal prongs; aedeagus (Fig. 66) with dorsal sac of conjunctiva rather short and without sclerotized areas, lobes on dorsal sac as follows: no proximal lobes present; left and right median lobes large and of equal size and shape; apex of sac somewhat trifid; total length 17.9.

L. rubescens is a rather unusual species but it does have some characteristics in common with *fulvicornis*. The most striking similarities are the presence of a pale yellow longitudinal stripe on the abdominal tergum; the coarseness and shape of the pronotal punctures, the dark reddish ground color, and the lack of pale markings on the pronotum and hemelytra. The bases and shanks of the claspers are similar, but the hook in *rubescens* is exceedingly different in that it bends completely around ventrally and the tip points out laterally. No other *Leptoglossus* species has this kind of hook. The dorsal

margins of the capsules bear no resemblance to each other, with *fulvicornis* having the unique condition. The aedeagal similarities and differences are: both species have the dorsal sac unsclerotized without proximal lobes; medial lobes are present but are smaller and more distally placed in *rubescens*.

The long tapering humeral areas, the steeply declivent pronotum, and the rounded and simple median notch on the genital capsule will further distinguish *rubescens* from *fulvicornis*.

Distribution: Known only from the type locality.

Material Examined: Holotype: ♂. BRAZIL. In British Museum (Natural History).

***Leptoglossus fulvicornis* (Westwood)**

Anisoscelis fulvicornis Westwood, 1842:17.

Leptoglossus fulvicornis Stål, 1870:161.—Distant, 1901a:330, pl. 30, fig. 4.—Van Duzee, 1917:89.—Gibson, 1917:70.—Parshley, 1923:747.—Blatchley, 1926:221.—Torre-Bueno, 1941:49.

Leptoglossus magnoliae Heidemann, 1910:191–5, pl. 7.

Theognis fulvicornis Hussey, 1953:30.

Dorsum and venter light to dark reddish brown without pale markings on pronotum or hemelytra; thoracic and abdominal venter mottled with numerous small piceous spots; abdominal tergum with a yellowish median longitudinal fascia; pronotum coarsely punctate almost rugulose, with lateral and postero-lateral margins serrate to dentate; humeri broadly and obtusely rounded; outer tibial dilations lanceolate with two or three very shallow emargination.

Clasper (Fig. 10) with a long broad base and inner basal lobe obsolete; shank without a median lobe; hook short and strongly curved; capsule (Fig. 35) with median notch deep, bottom of notch raised and acute; dorsal prongs broadly rounded and directed medially; aedeagus with dorsal sac of conjunctiva without sclerotized areas, and with only one pair of medial lobes.

In the discussion under *rubescens*, the similarities and differences between *rubescens* and *fulvicornis* are pointed out. The relationship of these two species to *dilatocollis* is discussed under the latter species.

The aedeagus in *fulvicornis* is similar in some respects to those of *australis* and *gonagra*. All three species have a long dorsal sac which is totally unsclerotized, and only the median lobes are present. In *fulvicornis* these median lobes are much longer than and not as close to the apex as are those of *australis* and *gonagra*. From all other North American species, *fulvicornis* may be easily distinguished by having lanceolate tibial dilations, a unicolorous dorsum without a pale

transverse fascia on the corium or pale pronotal markings, dentate pronotal lateral margins, broadly rounded humeral angles and the rugulose-like surface of the pronotum.

Heidemann's description of *magnoliae* is based on a male and female, type No. 13228, in the United States National Museum. Both specimens bear the same type number, and I have selected as LECTO-TYPE the male specimen; a label to that effect has been attached to the specimen. In the original description, Heidemann also gives information on the feeding habits, and includes descriptions of the eggs and nymphs. The host plant apparently is *Magnolia*.

Distribution: Recorded from Massachusetts and New York and south to Florida and Alabama. A single specimen labeled "Mexico on bananas, Brownsville, Texas" is in the United States National Museum.

Material Examined: 56 specimens: *Florida*: Winter Park; Port Sewall. *Georgia*: Savannah. *Massachusetts*: Humarock. *New Jersey*: Anglesea; Lahaway. *New York*: Rockaway Beach; Long Beach; New York City. *North Carolina*: New Bern; Fort Macon; Southern Pines. *Pennsylvania*: Philadelphia. *Virginia*: Va. Beach; Shenandoah National Park; Falls Church. *Washington, D.C.* In United States National Museum, American Museum of Natural History, Museum Comparative Zoology (Harvard), Stockholm Museum, J. A. Slater and R. C. Allen collections.

***Leptoglossus dilaticollis* Guerin**

(Fig. 1)

Leptoglossus dilaticollis Guerin, 1831:pl. 12, fig. 9.—Guerin, 1838: 174.—Stål, 1870:161.—Distant, 1902:382.—Kirkaldy, 1906: 257.—Kiritschenko, 1935:191.—Costa Lima, 1940:85, fig. 292.—Dupuis, 1952:449.—Hussey, 1953:33.

Pronotum, scutellum, clavus and corium dark reddish brown with head and teeth on margins of pronotum piceous; wide straight transverse fascia on corium and fourth antennal segments whitish yellow; head laterally and with two short stripes above, first three antennal segments and undilated portion of hind tibiae tan to light brown; legs light reddish brown with lateral portion of hind femora fuscous distally; tibial dilations and first three antennal segments with a narrow stripe above fuscous; thoracic and abdominal venter reddish brown with numerous small piceous spots frequently fusing to form larger maculae; connexivum, abdominal dorsum, femoral and tibial teeth and tubercles piceous with a narrow median longitudinal stripe on abdominal dorsum ochraceous; membrane uniformly dark; pronotum

with numerous conspicuous large rounded foveolae and smaller punctations; clavus and corium finely and closely punctate; scutellum transversely rugulose with few punctures; venter with a moderate amount of pale short erect and appressed pubescence; dorsum with short appressed and semi-decumbent yellowish hairs and sparse longer pilose hairs.

Head porrect with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga, forming a rounded elevated ridge, length head 4.56, width head 3.12, interocular distance 1.68, anteocular distance 2.76; pronotum steeply declivent, lateral and postero-lateral margins strongly dentate, some teeth almost spinose, humeral areas broadly expanded into long and wide anteriorly curving slightly ascending processes, calli barely elevated, area between calli almost indistinct from calli and only slightly higher, disk posteriorly with median longitudinal carina obsolete, length pronotum 5.26, width across humeri 17.6, width anterior margin pronotum 2.52; length scutellum 3.36, width scutellum 3.96; labium extending to middle of seventh abdominal sternum; length labial segments I 5.40, II 5.88, III 4.44, IV 9.36; length antennal segments I 3.00, II 5.64, III 4.56, IV 6.60; hind tibiae with outer dilations lanceolate, occupying 64% length of hind tibiae, width about one and a half times width of inner dilations; inner dilations lanceolate, slightly shorter than outer, furnished with numerous small spine-like teeth along margins; inner margins of undilated portions with a double row, and dorsal margins of hind tibiae for entire length with a single row, of numerous small spine-like teeth, length hind tibiae 12.5; length outer dilations 8.32, width outer dilations 2.04; length inner dilations 7.20, width inner dilations 1.32.

Claspers (Fig. 9) with inner basal lobe obsolete and width base gradually tapering to form shank, shank without median lobe, hook strongly curved; capsule (Fig. 34) with median notch shallow, dorsal prongs low, forming a sinuate posterior margin; aedeagus with dorsal sac of conjunctiva as follows: proximal lobes present; two median lobes present on left side only, one short and small below a larger and wider blunt lobe; no distal lobes present; all areas on dorsal sac unsclerotized; total length 29.0.

The above description is of a male specimen from Brasilia, Rio Grande, Brazil.

There is very little variation in the small series examined. Three females and one male lack the small teeth on the dorsal edge of the hind tibiae. Labial extensions vary from the middle of the sixth to just past the posterior edge of the seventh abdominal sternum.

L. fulvicornis, *rubescens*, and *dilatocollis* resemble each other to

some extent in having a narrow yellow median longitudinal stripe on the abdominal dorsum, claspers with a broad base and the inner basal lobe obsolete, and the shank without a median lobe. The dorsal sac of the conjunctiva is unsclerotized. Both *fulvicornis* and *dilaticollis* have lanceolate tibial dilations.

The resemblance of these three species to one another is more superficial than an indication of a close relationship. *L. rubescens* and *dilaticollis* are quite specialized members of the genus as evidenced by the shape of the genital structures. This is especially true of *dilaticollis* with its unique humeral expansions and long labium.

Costa Lima (1940) reported *dilaticollis* on *Magnolia* sp.

Distribution: Brazil, Central America, and Mexico.

Material Examined: MEXICO: 1 ♂, Rinton, Antonio, Oaxaca, Feb. 1908 (F. Hamilton). PANAMA: 1 ♂, no data. BRAZIL: 1 ♂, Corupa, S. Cath. (Hansa Humboldt), Apr. 1948 (A. Maller); 1 ♂, same except III-1949; 1 ♂, Rio Grande; 1 ♀, Rio Grande do Sul; 1 ♀, same except (Staudgr); 1 ♀, no locality (Boucard). In Hungarian National Museum, Stockholm Museum, and American Museum of Natural History.

***Leptoglossus australis* (Fabricius)**

Cimex australis Fabricius, 1775:708.

Cimex membranaceus Fabricius, 1781:351.

Cimex momordicae Forster, 1844:16.

Cimex orientalis Dallas, 1852:454.

Anisoscelis bidentatus Montrouzier, 1855:101.

Anisoscelis flavopunctatus Signoret, 1863a:27, pl. 21, fig. 4.

Leptoglossus membranaceus bidentatus, Schouteden, 1907:113.

Leptoglossus membranaceus sumbawensis Blöte 1936:29.

This is the only species of *Leptoglossus* that occurs outside of the Western Hemisphere. It is readily recognized by its black or dark brownish color with the following reddish orange or yellowish markings: a narrow arcuate transverse fascia on the pronotal disk, the medial portion of the second, third and apical half of the fourth antennal segments, numerous large maculae covering the entire ventral surface, and a small spot on the mediocubital crossveins. The humeral angles vary from long and spinose to obtuse. The outer tibial dilation may be narrow and lanceolate or wide and phylliform. The claspers (Fig. 12) lack an inner basal lobe and the inner margin gradually tapers into the shank portion; the shank lacks a median lobe and the hook is strongly curved; the capsule (Fig. 37) has a deeply rounded median notch and no dorsal prongs; in the aedeagus the dorsal sac of the

conjunctiva is long and has only small median lobes near the apex; all areas of the dorsal sac are unsclerotized.

L. australis has, until recently, been treated as one of three closely related species. The group was composed of *membranaceus*, *bidentatus* and *australis*. Some authors had relegated *bidentatus* to sub-specific rank under *membranaceus*. It is true that individuals referred to as *membranaceus* from the Ethiopian and Oriental regions are quite distinct from specimens of "*australis*" in the South Pacific Islands. However, examination of the large number of specimens assembled in the present study confirms Gross's (1963) opinion that only one species is involved. Individuals from Tahiti, Fiji, New Hebrides, American Samoa, and the Society Islands are small, have subacute humeral angles, and the outer tibial dilation is narrow with one or two shallow emarginations (Fig. 53). Westward to New Guinea and northern Australia specimens tend to be larger and more deeply emarginate. Also present in Australia are specimens that resemble individuals from Tahiti and Fiji. In New Guinea an occasional individual will have a spinose humeral angle. All 32 specimens examined from the Philippines have prominently spinose humeral angles, but here the tibial dilation is more variable, being as wide as African specimens and as narrow as Australian specimens. Throughout the Oriental and Ethiopian regions, specimens consistently have a spinose humeral angle, with the overall size and the width of the outer tibial dilation (Fig. 52) averaging slightly larger than individuals from Australia or New Guinea. These characters seem to be clinal in nature, and a detailed study needs to be undertaken in order to establish the exact relationships. Fortunately, *australis* is a common insect, and large numbers of specimens are available for study.

The relationship between *australis* and *gonagra* is extremely close. In fact, this relationship is not paralleled by any other pair of species in this genus, if one takes into consideration both similarity and distribution. *L. gonagra* is quite distinct from all other *Leptoglossus* species in the Western Hemisphere, which unmistakably makes it stand out as the ancestral stock from which *australis* was derived. These two species share in common the same distinctive color pattern, the same general habitus, and genitalia which are, as far as I can tell, identical. Also the vagility of *australis* and *gonagra* are of the same magnitude, with *gonagra* the most widely distributed species in the New World and *australis* having a tremendous geographic range in the Eastern Hemisphere. It should be mentioned that the present distribution of *australis* may have been in part helped by man, since *australis* is a known pest on various agricultural crops. It cannot be over-empha-

sized that these two species are very closely allied and the characters that distinguish each from the other are not strikingly different. In fact, the validity of their being considered two species may be questioned. On the other hand, selective pressures that would favor morphological distinctness may not have been in operation, since the geographic separation once established, would provide an effective reproductive barrier. Breeding and cytological information will in all likelihood provide answers to the questions concerning the exact nature of this relationship.

The dispersal route into the Eastern Hemisphere may be envisioned as occurring via Africa, for some African specimens of *australis* resemble more closely *gonagra* in color and humeral spine shape than do individuals from other parts of the range. The alternative to this is a route through the oceanic islands of the Pacific, even though the *australis* specimens in the Pacific Islands are morphologically more distinct from *gonagra* than African specimens. Gross (1963) pointed out that the Pacific Island Heteroptera tend to be smaller, and that spines and dilations becomes somewhat smoothed as compared to individuals of the same species on adjacent continental or large land areas. With this in mind, the latter route may be thought of as a rather rapid spread through the islands to the Asian continent and then a subsequent loss of the prominent humeral spines and large tibial dilations on the smaller islands.

From *gonagra*, *australis* can be distinguished by the shorter tibial dilation (65–75% the length of the hind tibiae), the absence of yellow spots on the scent gland scars, and the generally darker brown color (some specimens of *australis* are the same chocolate brown as is *gonagra*). The genitalia of these two species are essentially the same.

The life history, economic importance and control of *australis* has been reported by Szent-Ivany and Catley (1960), Fernando (1957) and Pagden (1928). The latter two authors use the name *L. membranaceus*. A few of the host plant records are cotton, beans, citrus, banana, guava, wild passionfruit and nearly all cucurbitaceous plants. For a complete list of references and generic name changes consult Gross (1963). Schaefer (1965, 1968) describes some morphological aspects of *australis* in his studies on the higher classification of the Coreoidea.

Distribution: Most of Africa, Madagascar, Seychelles Is., Indian subcontinent, Taiwan, South East Asia, Malay Archipelago, Indonesia, Philippines, Micronesia, New Guinea, Northern Australia, New Hebrides, New Caledonia, Solomon Islands, Fiji Islands, Samoa, Cook Island, Tahiti.

Material Examined: Approximately 500 specimens from the above localities.

***Leptoglossus gonagra* (Fabricius)**

Cimex gonagra Fabricius, 1775:708.

Cimex grallator Herbst, 1784:259.

Lygaeus gonagra Fabricius, 1794:140.

Anisoscelis antica Herrich-Schaeffer, 1836:92, fig. 316.

Anisoscelis gonagra Burmeister, 1835:332.

Theognis gonager Mayr, 1866:103.

Leptoglossus gonagra Stål, 1868:51; 1870:165.—Berg, 1879:72.—

Distant, 1881:126.—Lethierry and Severin, 1894:47.—Van Duzee, 1917:89–90.—Gibson, 1917:72.—Blatchley, 1926:224.—Barber, 1939:310–11.—Torro-Bueno, 1941:40.—Froeschner, 1942:594, 599.—Barber and Bruner, 1947:80.—Hussey, 1953:31.

Anisoscelis praecipua Walker, 1871:128.—Distant, 1901:431.

L. gonagra is easily distinguishable from all other *Leptoglossus* species in the Western Hemisphere by the presence of the following yellow areas that strongly contrast with the dark brown color: a narrow arcuate transverse fascia on the pronotal disk, numerous large maculae on the thoracic pleura; seven yellowish longitudinal stripes on the abdominal venter which occasionally are interrupted at the intersegmental sutures, if so, the stripes are made up of a series of rectangular maculae. Also, the humeral angles are strongly spinose, although this is more variable than the color pattern. The outer tibial dilation (Fig. 54) is relatively narrow and gradually tapers to almost the end of the tibiae and occupies about 85 to 90% the length of the hind tibiae.

L. gonagra can be separated from *australis* on the basis of the longer outer tibial dilations, the usually lighter color, and the presence of yellowish round spots on the scent gland scars.

L. gonagra has been reported as a pest on cucurbitaceous plants, *Passiflora*, citrus, and tobacco in Argentina and Brazil (Bosq 1940, Costa Lima 1940); oranges, grapefruit, squashes, pumpkins, corn and guava in Puerto Rico (Wolcott 1948); as breeding on *Luffa cylindrica* M. Roem. and adults feeding on oranges, guavas, and *Taonabo parviflora* Krug. & Urb. in Cuba (Barber and Bruner 1947). Hussey (1952) reported *gonagra* on Brazilian pepper trees (*Schinus terebinthefolia* Raddi) in Florida. It has also been collected on water-melons in Louisiana.

Distribution: From Florida to Texas and south through Mexico

and Central America, into the West Indies, and most of South America.

Material Examined: 51 ♂, 43 ♀, UNITED STATES: *Louisiana*; *Florida*. MEXICO: Veracruz; Nochixtlan; Quint. Roo. Xcan Nuevo; La Palma; Vera Cruz; Guerrero, Acapulco; Tezonapa; Chichen Itza; Temax. EL SALVADOR: Quezaltepeque. BRITISH HONDURAS: Benque Viejo; Jamastran. WEST INDIES: St. Croix; St. Vincent; Nevis; Puerto Rico; Cuba; Dominican Republic, Sanchez; Pto. Plata; Haiti; Grande Riviere; Cape Haytien. VENEZUELA: Merida; Caripito. BOLIVIA: Province Sara; Coroico. BRAZIL: Minas Geraes, S. da Caparao; Tres Lagoas, Matto Grosso; Rio Grande so Sul; Rio de Janeiro; Madeira Mamore; Corupa, S. Cath. (Hansa Humboldt); Bahia; Herculanoum; Meilen v. Cuyaba. PARAGUAY: Asuncion. ARGENTINA: Eldorado Misiones. In Hungarian National Museum, American Museum of Natural History, Stockholm Museum, Museum of Comparative Zoology (Harvard), Berlin Humboldt University Museum, British Museum (Natural History), University of California (Davis), University of Kansas, Chicago Natural History Museum, Iowa State University, J. A. Slater and R. C. Allen collections.

***Leptoglossus chilensis chilensis* (Spinola)**

Anisoscelis chilensis Spinola, 1852:172.—Signoret, 1863b:555.—Reed, 1900:46.

Theognis chilensis Mayr, 1866:108.

Leptoglossus chilensis Stål, 1870:164.—Lethierry and Severin, 1893:46.—Pennington, 1922:132.

Pronotum behind humeri, scutellum, clavus and corium a variegated light brown and dark reddish brown with numerous small piceous spots; head above and below, pronotal calli and outer marginal areas of first antennal segments piceous; entire declivous face of pronotum, apex scutellum and corium wine red; head laterally and with three narrow stripes above, inner margins of first and last three antennal segments entirely, fore, middle and undilated area of hind tibiae, and basal and ventral portion of all femora light reddish brown; distal portion of femora dorsad, and tibial dilations fuscous to piceous with teeth and tubercles piceous; thoracic and abdominal venter dark reddish brown with numerous small spots frequently fusing to form larger maculae; connexivum and abdominal dorsum piceous with anterior fourth of connexival segments ochraceous; membrane uniformly dark; pronotum, clavus and corium coarsely and closely punctate with surface above punctures uneven; scutellum

transversely rugulose with few punctures; body rather thickly covered with appressed whitish silvery pubescence and sparse short erect hairs; head below, thoracic and abdominal midventer, and appendages with longer dense erect pilosity.

Head non-declivent with both tylus and juga raised above level of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge, slightly exceeding juga, length head 2.04, width head 1.92, interocular distance 1.08, anteocular distance 1.08; pronotum abruptly declivent, lateral margins sinuate, serrate caudally, humeral areas broadly and obliquely ascending, humeral angles subacute, postero-lateral margins serrate, disk posteriorly with median longitudinal carina obsolete, calli slightly elevated, raised area between calli with two small tubercles, length pronotum 2.24, width across humeri 4.32, width anterior margin of pronotum 1.56; length scutellum 1.56, width scutellum 1.68; labium extending to middle of metasternum, length labial segments I 1.68, II 1.56, III 1.20, IV 1.50; length antennal segments I 2.04, II 3.12, III 2.04, IV 2.64; hind tibiae with outer dilations barely phylliform with two shallow emarginations, occupying 64% length of hind tibiae and about twice width of inner dilations; inner dilations lanceolate, shorter than outer dilations, furnished with a few small spine-like teeth on distal margins; inner margins of undilated portions of hind tibiae with a few small spine-like teeth arranged in a double row, length hind tibiae 6.00; length outer dilations 3.84, width outer dilation 1.20; length inner dilations 3.24, width inner dilations 0.60.

Claspers (Fig. 13) with inner basal lobe small and rounded, shank thin with well produced median lobe, hook short and strongly curved; capsule (Fig. 38) with a rounded median notch, no dorsal prongs, lateral margins slightly flared; aedeagus with dorsal sac of conjunctiva as follows: proximal lobes present and sclerotized; median lobes present, left lobe long and wide, right lobe shorter and more narrow; sclerotized anterior distal lobe present; lateral distal lobes of same size and shape, both sclerotized; total length 13.0.

The above description is of a male specimen from El Alfalfal, Province Santiago, Chile. In a large series of specimens the following variations were noted. The last antennal segment varies from entirely light reddish brown to fuscous. The entire declivous face of the pronotum varies from bright yellow to dark tan and is with or without small piceous maculae. A few individuals have so many large and small maculae that the yellow areas are barely evident. These yellow areas may be separated medially forming two distinct spots. The labium varies in length from the middle of the metasternum to the anterior margin of the second abdominal sternum, only rarely does it extend to the anterior margin of the third abdominal sternum. Most

specimens have very shallow emarginations on the outer tibial dilations, but some females have a more phylliform dilation with deep emarginations.

Typical *chilensis* specimens seem to be absent from the north and northeastern corner of Argentina, and it is here that one finds *concaviusculus*. I have also examined from this area a number of specimens that have characters of both *chilensis* and *concaviusculus*. I believe that the two "taxa" are conspecific, with *concaviusculus* a distinct subspecific unit.

L. argentinus described by Bergroth (1894) from La Plata fits the description of *chilensis*. This was also the opinion of Pennington (1922), although he did not list *chilensis* from that area. I have not seen Bergroth's type, but there seems little doubt that he had a specimen of *chilensis*.

L. chilensis is closely related to *impictus*; for the diagnostic characters see the discussion under the latter species.

Thus far *chilensis* has been collected on peaches, nectarines, plums, grapes, figs, and grapefruit.

Material Examined: CHILE: 52 ♂, 48 ♀, Province Santiago: El alfalfal; Los Maitenes; El Canelo; Lampa. Province Talca: Talca. Province O'Higgins: Rancagua. Province Nuble: San Carlos. Province Malleco: Angol. Province Cautin: Temuco; Araucancia. Province Bio-Bio: Antuco. Province Coquimbo: Illapel; Huanta. Province Aconcagua: Papudo; Rio Blanco. Province Valparaiso: Valparaiso. Province Concepcion: Concepcion. ARGENTINA: 6 ♂, 3 ♀, Mendoza; 2 ♀, Cabana Cordoba, III-1945 (M. Biraben); 2 ♀, same except 8-11-1937; 2 ♂, 2 ♀, Rio Negro, I-1943, "s/papa" (J. M. Bosq); 1 ♂, 1 ♀, Province de San Juan, I-1940 (J. M. Bosq); 1 ♂, San Juan (J. M. Bosq); 1 ♂, Correntoso, L. Nah Huapi, 20-X-1926 (R. C. Shannon); 1 ♀, Tolombon, Salta, 7-III-1939 (Biraben-Scott); 1 ♀, 1200 m. Province Salta 2.05 (J. Steinbach S.V.); 1 ♀, Catamarca, Los Angeles, X-1945 (J. M. Bosq); 1 ♀, Catamarca, El Rodeo, I-1942 (Schaefer); 1 ♂, Cabana, Cordoba, 10-11-1942 (M. Biraben); 1 ♀, Isla Los Cisnes, Parana Delta, V-XI-1920 (H. E. Box); 1 ♂, El Bolson, Rio Negro, III-15-1964 (A. Kovacs); 1 ♀, Bariloche, Rio Negro, Nov. 1926 (R. & H. Shannon); 2 ♂, Metan Salta, 1906-I (Vezenyi). In Hungarian National Museum, La Plata Museum, Museum of Comparative Zoology (Harvard), Deutsches Entomologisches Institut, Berlin Humboldt University Museum, Stockholm Museum, United States National Museum, California Academy of Sciences, British Museum (Natural History), American Museum Natural History, J. A. Slater and R. C. Allen collections.

Leptoglossus chilensis concaviusculus Berg new status

Leptoglossus concaviusculus Berg, 1892:70.—Lethierry and Severin, 1894:47.—Pennington, 1922:134.

Pronotum behind humeri, scutellum, clavus and corium uniformly dark reddish brown with head above and mid-ventrally, outer marginal areas of first antennal segments and pronotal calli piceous; entire declivous face of pronotum, and last antennal segment yellowish brown; apex scutellum and large maculae on inner tibial dilations whitish yellow; head laterally and with three narrow stripes above, inner margins of first and entire second and third antennal segments, fore and middle legs, basal third and ventral portions of hind femora, and undilated portion of hind tibiae light reddish brown; dorsal three fourths of hind femora distally, and tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter dark reddish brown with numerous small piceous spots confined to abdominal mid-venter; connexivum and abdominal dorsum piceous with connexival incisures ochraceous; membrane uniformly dark; pronotum, clavus and corium coarsely and closely punctate with surface above punctures uneven; scutellum transversely rugulose with few punctures; body rather thickly clothed with appressed golden pubescence and sparse short erect hairs; appendages, thoracic and abdominal mid-venter also with dense longer erect pilosity.

Head non-declivent with both tylus and juga raised above level of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge, slightly exceeding juga, length head 1.92, width head 1.80, interocular distance 0.96, anteocular distance 1.08; pronotum abruptly declivent, lateral margins sinuate and serrate caudally, humeral areas broadly and obliquely ascending, humeral angles sub-acute, postero-lateral margins serrate, disk posteriorly without a median longitudinal carina, calli slightly elevated, raised area between calli non-tuberculate, length pronotum 2.40, width across humeri 4.32, width anterior margin pronotum 1.32; length scutellum 1.68, width scutellum 1.80; labium extending to middle of metasternum, length labial segments I 1.56, II 1.44, III 0.84, IV 1.20; length antennal segments I 1.80, II 2.88, III 1.68, IV 2.52; hind tibiae with outer dilations phylliform with two deep emarginations, occupying 77% length of hind tibiae, and about two and a half times width of inner dilations; inner dilations lanceolate, shorter than outer dilations, furnished with a few small spine-like teeth on distal margins; inner margins of undilated portion of hind tibiae with numerous small spine-like teeth arranged in a double row, length hind tibiae 6.24; length outer dilations 4.80, width

outer dilations 1.56; length inner dilations 3.72, width inner dilations 0.60; genitalia as in *chilensis*; total length 12.8.

This subspecies exhibits essentially the same variation in color patterns as found in *chilensis*. The declivous area of the pronotum may be entirely bright yellow or yellowish brown, or the entire pronotum may be unicolorous. The pronotal disk sometimes has two large medially separated diffuse spots. The dorsum varies from light to dark reddish brown, but is essentially unicolorous not variegated.

L. c. concaviusculus, originally described from Brazil, forms a population distinct from *chilensis*, which is more southern. Along the areas of contact between these two populations there occur a number of specimens intermediate between the two subspecies. The material examined shows the overlapping distribution to be in the northern and northeastern portion of Argentina. In *concaviusculus*, distinguishing characters are the lack of small piceous maculae on the dorsum and thoracic pleura, and the dorsum being lighter and unicolorous brown. In *chilensis* these same areas have numerous piceous maculae and the dorsum is usually a variegated dark brown and fuscous. *Concaviusculus* has a somewhat longer fourth antennal segment averaging 1.48 times the width of the head. In *chilensis* the average is 1.2. The width of the outer tibial dilation to width of head ratio is larger for *concaviusculus*, average 1.1 (0.8–1.6); in *chilensis* the same ratio averages 0.6 (0.5–0.9). *Concaviusculus* has a longer outer tibial dilation (Fig. 63) occupying 76% (71–80%) the length of the hind tibiae, whereas in *chilensis* the dilations (Fig. 62) occupy 65% (62–71%).

Distribution: Northern and northeastern portion of Argentina; Paraguay; Uruguay; southern Brazil.

Material Examined: Syntype Series: 1 ♂, 2 ♀, Brazil. In the La Plata Museum. Berg's type series is mixed, a ♀ from Chaco which bears the label *Leptoglossus concaviusculus* is actually a specimen of *impictus*. Of the remaining two specimens, I have selected the ♂ as LECTOTYPE, and have placed an appropriate label on the specimen. BRAZIL: 1 ♀, Corupa, S. Cath. (Hansa Humbolt), Apr. 1948 (A. Maller); 1 ♂, same except March 1948; 1 ♂, 1 ♀, Rio Natal, S. Cath., XII-1945 (A. Maller); 1 ♀, Cauna, S. Cath., XII-1945 (A. Maller); 1 ♀, Pinhal, S. Cath., Dec. 1948 (A. Maller); 1 ♂, R.G. do Sul, Pio Busk; 1 ♀, Rio Grande do Sul; 1 ♀, Sao Paulo (A. Heine); 1 ♀, Sao Paul; 2 ♀, Sao Leopoldo; 2 ♂, 1 ♀, Brazilien. PARAGUAY: 3 ♂, Asuncion; 1 ♂, no data (Berg). URUGUAY: 3 ♂, Montevideo (Colon), 12-XII-1929 (Tremoleras); 2 ♂, Montevideo, W. del Cerro, 31-XII-1932 (Tremoleras); 1 ♀, Cerro Largo, Canada de los Burros (Tremoleras); 1 ♂, no data (Berg); 1 ♀, no data (Boucard). AR-

GENTINA: 4♂, 5♀, Misiones Pindapoy, X-1935 (J. M. Bosq); 4♀, same except III-1936; 1♂, 2♀, Entre Rios, Concordia, II-1930 (J. M. Bosq); 1♀, same except IV-1931; 1♀, Corrientes, "on citrus," 10-1935 (J. M. Bosq); 1♀, Corrientes; 1♂, Corrientes, 1-1921 (De-Carlo); 1♂, Corrientes, San Roque, II-1920 (J. M. Bosq); 2♂, 1♀, Cordoba (W. M. Davis); 1♂, La Granja, A. Gracia, Cordoba, 4-1-1939 (C. Bruch); 1♀, Gl. Gracia; 2♀, Forosa (Ciud.), 28-IV-1936 (Denier); 1♀, Formosa, Dto. Pilaga, IV-1938 (Denier); 1♂, 2♀, Prov. Salta, 2500 m. (J. Steinbach, S.V.); 1♀, Santa Fe (J. Steinbach, S.); 3♂, 1♀, Isla de Oro, Formosa, 30-III-1938 (Denier); 1♂, 1♀, R. Arg. La Plata (C. Bruch); 1♂, 1♀, San Ignacio, Misiones, 8-XII-1914 (Biraben, Bezzi); 2♀, Puerto Tirol, Chaco, 10-IV-1936 (Denier); 2♀, Province de Buenos Aires (J. M. Bosq); 1♂, Delta Rio Chana, II-1922 (J. M. Bosq); 1♂, Delta Abra Vieja, 15-II-1926 (J. M. Bosq); 1♀, Isla Los Cisnes, Parana Delta, V-XI-1920 (H. E. Box); 1♂, Resistencia, II-1936 (Denier); 1♀, Cabana Cordoba, 4al., 8-II-1947 (Biraben); 1♂, Santiago del Estero, Rio Salado (Wagner); 1♂, Fontana, Chaco, XII-1935 (Denier); 1♂, Chaco (Berg); 1♂, Chaco, 22-X-1899 (S. Venturi); 1♀, Iguazu; 1♀, Province de Cordoba Coconcho, II-1919; 1♀, Salta Capital, 18-IV-1946 (R. Maldonado Bruzzzone); 2♂, Corrientes, Corrientes, 15-30-II-1959 (Biraben); 1♀, Manatiales, Corrientes, 1-10-III-1959 (Biraben); 1♂, La Aurora, Sgo. del Estero, II-VI-1945 (R. M. Bruzzzone); 2♂, 1♀, José C. Paz, Bs.As., XI-1944 (A. R. Bezzi); 1♀, Toma de Agua, E. Rios, 27-IV-1951 (B. A. Torres); 1♂, 1♀, Ibicuyito, Bs.As., X-1940 (S. R. Castillo); 3♀, José C. Paz, Bs.As., XII-1948 (A. R. Bezzi); 1♀, City Bell, Bs.As., III-1945 (A. Alba); 1♂, San José Misiones, I-1953 (R. Euembuena); 1♂, Clorinda, Formosa, IV-1940 (Denier); 1♂, Ituzaingo, Corrientes, II-1947 (Biraben); 1♀, Pindapoy Misiones, 29-VI-1937 (Denier); 1♂, 1♀, Fontana, Chaco, 20-V-1936 (Denier); 2♂, 4♀, Resistencia, Chaco (Denier); 1♂, Chaco, Rio Araya, IV-1936 (Denier); 3♂, 1♀, Mburucuyá, Corrientes, 16-23-XI-1957 (Birabén); 3♂, 4♀, Manatiales, Corrientes, II-1946 (Birabén); 4♂, 7♀, Manantiales, Corrientes, V-1946 (T. de Apestol); 2♀, Fontana, Chaco, 28-IV-1936 (P. Denier); 1♂, San Javier Misiones, 4-VII-1937 (P. Denier); 7♂, 8♀, S. José, S. Javier, Pindapoy Misiones, 10al., 29-I-1959 (G. Raimondo); 1♂, La Plata, no data; 1♀, Villa Mariá Cordoba, III-1939 (H. Parko); 1♂, Neuquén, XII-1932 (Koehler); 1♂, St. Cruz (Hensel S.). In Berlin Humboldt University Museum, Hungarian National Museum, Stockholm Museum, Carnegie Museum, Museum of Comparative Zoology (Harvard), La Plata Museum, J. A. Slater and R. C. Allen collections.

***Leptoglossus impictus* (Stål)**

Anisoscelis impicta Stål, 1859:233.

Theognis impictus Mayr, 1866:104.

Leptoglossus impictus Stål, 1870:164.—Lethierry and Severin, 1893:48.—Berg, 1879:72.—Pennington, 1922:131–2.

Pronotum, clavus and corium uniformly dark tan with head above and below and pronotal calli piceous; head with lateral areas and three narrow stripes above light reddish brown; first three antennal segments (with the fourth somewhat lighter), scutellum, veins of clavus and corium, fore and middle legs, undilated portion of hind tibiae, and entire venter dark tan to light reddish brown; apex scutellum, large maculae on inner and a few small maculae on outer tibial dilation whitish yellow to ochraceous; lateral and ventral portion of hind femora and bases of teeth and tubercles light reddish brown, remainder of hind femora and tibial dilations fuscous with tips of teeth and tubercles piceous; connexivum and abdominal dorsum piceous with anterior fourth of connexival segments and apical fourth of last tergum laterally ochraceous; membrane uniformly dark; hind wing concolorous; pronotum, clavus and corium closely punctate with surface above punctures uneven; scutellum transversely rugulose with few punctures; body with whitish to golden appressed, short, erect hairs; legs more densely clothed with long erect pilosity.

Head non-declivent with both tylus and juga raised above level of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge slightly exceeding juga, length head 2.04, width head 2.04, interocular distance 1.20, antocular distance 1.20; pronotum steeply declivent, lateral margins strongly sinuate and denticulate caudally, humeral areas broadly and obliquely ascending, humeral angles subspinose, postero-lateral margins serrate, disk without a median longitudinal carina, calli barely elevated, raised area between calli with two small tubercles laterally, length pronotum 2.72, width across humeri 6.24, width anterior margin 1.56; length scutellum 1.92, width scutellum 2.28; labium extending to posterior edge of metasternum, length labial segments I 1.80, II 1.68, III 1.08, IV 1.44; length antennal segments I 2.40, II 3.36, III 2.04, IV 2.28; hind femora strongly incrassate with a large number of well developed tubercles; outer dilations barely phylliform with two shallow emarginations, occupying 64% length of hind tibiae, and about twice width of inner dilations; inner dilations lanceolate, slightly shorter than outer dilations, furnished with many small spine-like teeth; undilated portion of hind tibiae on inner margins with a double row of small spine-like teeth; length hind tibiae 6.96; length outer dilations 4.44, width outer

dilations 1.44; length inner dilations 3.36, width inner dilations 0.60; genitalia as in *chilensis*; total length 14.9.

In a series of 70 specimens from Piedra Pintada, Neuquén, Argentina, the following differences were noted: dorsum a variegated dark brown and fuscous with numerous piceous maculae; some specimens with declivous face of pronotum entirely yellow or separated medially into two yellow areas, one specimen with entire pronotum yellow; size and number of tubercles and teeth on pronotum and hind femora greater than on other *impictus* individuals and usually entirely piceous. The remainder of the individuals examined are lighter than the above specimens, varying from light tan to dark brown. The holotype is the only individual I have seen without piceous maculae on the abdominal mid-venter.

L. chilensis may be distinguished from *impictus* by the narrower hind femora of the males (both sexes have approximately the same size femora) and by the smaller and fewer tubercles. This is most evident on the dorsal surface where there are only 5–10, whereas in *impictus* the hind femora of the males are noticeably more swollen and have many more prominent tubercles (15–20 on the dorsal surface). In *chilensis* the humeral areas are not greatly expanded and the humeral angles are sub-acute. In *impictus* the opposite is true with the humeral angles subspinose. *L. chilensis* is a narrower species, the length is usually greater than 2.5 times the width across the humeri; in *impictus* the length is usually less than 2.5 (*impictus* average 2.4 (2.2–2.6)—*chilensis* 2.8 (2.5–3.0)). The fourth antennal segment is slightly longer in *chilensis*, averaging 1.3 (1.1–1.7) times the width of the head; in *impictus* the average is 1.1 (1.0–1.3). There is some overlap in the measurements of the two previously mentioned characters and they are difficult to use diagnostically.

Because the series from Piedra Pintada resembles so closely the color pattern of *chilensis*, and there is no significant genitalia difference, I am led to doubt the validity of *impictus* as a species. Yet, *chilensis* and *impictus* seem to be sympatric in their distribution in Argentina, and *impictus* is a wider, more robust species. For these reasons, I think the best solution at the present is to retain *impictus* as a distinct species. There probably will remain some confusion regarding these two species, but until more biological and distributional data are at hand, the exact relationship cannot be understood.

Distribution: Argentina and Uruguay.

Material Examined: Holotype: ♂, Montevideo, Uruguay. In Stockholm Museum. ARGENTINA: 1 ♂, 3 ♀, Estancia Don Roberto, Lavaisse, St. Luis. 12 Oct. 1942; 1 ♂, Carmen, Patagones (Berg); 1 ♀, Santiago del Estero, Rio Salado (Wagner); 1 ♀, Santa

Fe (J. M. Bosq); 1♂, 1♀, Mendoza; 1♀, San Pablo, 1905-X (Vezényi); 1♂, Mendoza (H. Rolle, Berlin W.); 1♀, Rio Negro, Rio Colorado, XII-1930 (J. M. Bosq); 1♀, Cordoba, III-1944 (J. M. Bosq); 1♂, Cordoba (J. M. Davis); 1♀, Salta, Chicoana, "s/tabaco" (J. M. Bosq); 42♂, 28♀, Piedra Pintada, Neuquén, 9-11-1941 (R. Maldonado). In La Plata Museum, Hungarian National Museum, Museum of Comparative Zoology (Harvard), British Museum (Natural History), Deutsches Entomologisches Institut, J. A. Slater and R. C. Allen collections.

***Leptoglossus quadricollis* (Westwood)**

Anisoscelis quadricollis Westwood, 1842:17.

Anisoscelis inconspicuus Stål, 1860:32.

Theognis pulcher Mayr, 1865:434.—Mayr, 1866:106, fig. 25.

Leptoglossus quadricollis Stål, 1870:164.—Lethierry and Severin, 1894:48.

Leptoglossus impressicollis Berg, 1892:69.—Pennington, 1922:134.

NEW SYNONYMY.

Pronotum, scutellum, clavus and corium dark reddish brown with head above and below, pronotal calli and outer areas of first antennal segment piceous; pronotum and scutellum with indistinct piceous maculae; veins of clavus and corium reddish tan; medial area of third and entire fourth antennal segments, apex scutellum, and large maculae on inner tibial dilations yellow; head laterally and with three narrow stripes above, fore and middle legs, undilated portion of hind tibiae and inner margin of first antennal segments light brown; antennal segments two and remainder of three somewhat darker brown; distal three fourths of hind femora and tibial dilations fuscous with femoral teeth and tubercles piceous; thoracic and abdominal venter light brown with many small piceous spots frequently fusing to form larger maculae, also large piceous areas as follows: dorsal half of meso- and metapleura, mid-venter of thorax, most of ventral area on second, third, and fourth abdominal sterna; connexivum and abdominal dorsum piceous with connexival incisures ochraceous; membrane uniformly dark; pronotum, clavus and corium coarsely and closely punctate; pronotum with surface above punctures smooth medially, uneven laterally; scutellum transversely rugulose with few punctures; body and appendages with appressed golden pubescence and erect short hairs, becoming more dense on head, anterior portion of pronotum, propleura and hind femora; anterior portion of pronotum and scutellum with longer erect pilose hairs.

Head non-declivent with both tylus and juga raised above level

of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge, slightly exceeding juga, length head 2.04, width head 2.04, interocular distance 1.08, anteocular distance 1.20; pronotum steeply declivent, lateral margins sinuate and entire, humeral areas broadly and obliquely ascending, humeral angles subacute, postero-lateral margins barely crenulate, disk slightly tumid with a very shallow median longitudinal furrow, median longitudinal carina obsolete, calli prominently elevated, raised area between calli with two small tubercles, length pronotum 2.24, width across humeri 5.12, width anterior margin pronotum 1.44; length scutellum 1.80, width scutellum 2.04; labium extending to posterior margin of second abdominal sternum, length labial segments I 2.16, II 1.92, III 1.08, IV 1.92; length antennal segments I 2.40, II 3.60, III 2.16, IV 3.12; hind tibiae with outer dilations conspicuously phylliform with one shallow and three deep emarginations, occupying 81% length of hind tibiae, about twice width of inner dilations; inner dilations lanceolate, shorter than outer dilations, armed with many small spine-like teeth; undilated portion of hind tibiae with few small spine-like teeth arranged in a double row on inner margins, length hind tibiae 8.16; length outer dilations 6.60, width outer dilations 2.16; length inner dilations 5.52, width inner dilations 0.96.

Claspers (Fig. 14) with inner basal lobe low and rounded, shank thin without a median lobe, hook strongly curved; capsule with a rounded median notch, no dorsal prongs, lateral margins barely flared; aedeagus with dorsal sac of conjunctiva with sclerotized proximal lobes present; medial lobes present and unsclerotized, left lobe long and wide, right lobe shorter, more narrow; sclerotized anterior distal lobe present, two lateral distal lobes of same shape and size, both sclerotized; total length 14.4.

The description is of the male lectotype of *L. inconspicuus*.

In the small series of specimens examined, there is little variation in the color pattern, although one individual has the entire pronotum yellow and with small piceous spots. The labium varies in length from the posterior margin of the metasternite to the posterior margin of the second abdominal sternite.

L. quadricollis is a member of the *chilensis* group as evidenced by the short labium, lack of the transverse fascia on the corium, the genital capsule with a rounded median notch and no dorsal prongs. The lack of a serrate lateral margin on the pronotum, the larger and more phylliform tibial dilation, and the distinctive clasper with the median lobe of the shank absent will distinguish *quadricollis* from the other members of the group.

After examining the male holotype of *impressicollis* Berg, I found

it to be conspecific with *quadricollis* and I hereby formally synonymize *impressicollis*.

Distribution: Argentina and Brazil.

Material Examined: Syntype series of *Leptoglossus inconspicuus* Stål: 1 ♀, Brazil; 1 ♂, Brazil (F. Sahlb); 1 ♀, Rio Janeiro (F. Sahlb); 1 ♂, Rio Jan. (Stål). In Stockholm Museum. The ♂ specimen from Rio Jan. (Stål) is selected as LECTOTYPE of *inconspicuus*, and an appropriate label has been placed on the specimen to that effect. ♂ holotype of *Leptoglossus impressicollis* Berg from Corrientes, Argentina. In La Plata Museum. BRAZIL: 1 ♂, 1 ♀, Rio de Janeiro, Brasilien (Dr. Studt G.). In Berlin Humboldt University Museum.

***Leptoglossus dentatus* Berg**

Leptoglossus dentatus Berg, 1892:68.—Lethierry and Severin, 1894: 47.—Pennington, 1922:133.

Pronotum, clavus and corium uniformly dark reddish brown, head above piceous and veins of corium more reddish; apex scutellum, fourth antennal segments, fore and middle legs, basal third of hind femora, undilated portion of hind tibiae and maculae on tibial dilations yellowish to ochraceous; head below and with three narrow stripes above, first antennal segments (with segments two and three somewhat lighter), hind femora dorsally, and tibial dilations dark reddish brown; thoracic and abdominal venter light reddish brown with a single large piceous spot on antero-dorsal area of mesopleuron, pronotal teeth and femoral teeth and tubercles piceous; connexivum and abdominal dorsum fuscous with anterior fourth of connexival segments, large portions of antero-lateral areas of abdominal dorsum and segmental sutures bright yellow, strongly contrasting with remaining dark areas; membrane uniformly dark; pronotum, clavus and corium coarsely and closely punctate, surface above punctures uneven; scutellum transversely rugulose with few punctures; body with short appressed silvery white hair, very dense in patches on anterior pronotal disk; body with sparse short and long erect hairs; legs with more dense, longer, erect pilosity.

Head non-declivent with tylus and juga raised above level of antenniferous tubercles, tylus forming a rounded elevated ridge, barely exceeding juga, distal end of tylus slightly produced dorsally as a low rounded knob, length head 2.28, width head 2.16, interocular distance 1.20, anteocular distance 1.20; pronotum steeply declivent, lateral margins with well spaced teeth much larger than serrations on postero-lateral margins, humeral areas broadly rounded and almost vertically ascending, humeral angles acute, calli prominently elevated, raised

area between calli with two small tubercles, length pronotum 2.24, width across humeri 4.48, width anterior margin pronotum 1.44; length scutellum 1.92, width scutellum 1.80; labium extending to middle of metasternum, length labial segments I 1.92, II 1.80, III 1.08, IV 1.44; first antennal segment with a few short teeth, length antennal segments I 2.52, II 3.72, III 2.28, IV 3.96; hind tibiae with outer dilations phylliform, with two deep and one shallow emargination, occupying 66% length of hind tibiae and almost two and a half times width of inner dilations; inner dilations lanceolate, considerably shorter than outer dilations, distal margins furnished with a few small spine-like teeth, undilated portion of hind tibiae with a double row of small spine-like teeth on inner margins, length hind tibiae 7.44; length outer dilations 5.04, width outer dilations 2.04; length inner dilations 3.60, width inner dilations 0.60.

Claspers (Fig. 15) with inner basal lobe small and rounded, shank thin with prominent median lobe, hook short and strongly curved; capsule (Fig. 39) with a rounded median notch and with prominent but low rounded dorsal prongs, lateral margins flared; aedeagus with dorsal sac of conjunctiva with sclerotized proximal lobes; unsclerotized medial lobes present, right lobe almost as long as dorsal sac, left lobe shorter and not as wide; large anterior distal lobe present, lateral lobes present—one spinose, one rounded, all distal lobes sclerotized; total length 15.0.

The description is of a male specimen from Tucuman, Argentina. There is no significant variation in the material examined, except that some individuals have a few small piceous maculae on the abdominal venter.

L. dentatus is an easily identifiable species by the possession of strongly dentate pronotal lateral margins, the single large black spot on the metapleura, and the yellow pattern on the abdominal dorsum. The placement of *dentatus* within the *chilensis* group is based on the short labium and lack of the transverse corial fascia. The presence of small dorsal prongs on the capsule suggests a relationship to the *stigma* group. *L. dentatus* is one species in Division B that lacks numerous small piceous spots on the entire venter, although a few individuals have faint piceous spots confined to the abdominal mid-ventral area.

Mann (1969) reports that *dentatus* feeds upon a variety of cactus species, primarily prickly pear (*Opuntia* spp.).

Distribution: Argentina and Uruguay (Mann, 1969).

Material Examined: Holotype. 1 ♀, Cordoba, Argentina. In La Plata Museum, Argentina. ARGENTINA: 2 ♀, Santiago del Estero, Rio Salado (Wagner); 1 ♂, Corodoba (W. M. Davis); 1 ♂, Cordoba;

1 ♂, Tucuman, II-1-1950 (P. Wygodzinsky); 1 ♂, Guemes, IV-3-1930 (H. A. Jaynes); 1 ♂, 2 ♀, Santiago del Estero Fernandez, 30-1-1939 (J. M. Bosq); 2 ♀, Santiago del Estero (Wagner); 2 ♂, Chaco, Las Brenas, IV-1941 (Bosq); 1 ♀, Chaco, Asila Leg. (Bosq); 1 ♀, Corzuela, 8-1-1936 (Denier); 1 ♂, Colonia Benitez, 1-V-1939 (Denier); 1 ♀, Prov. de La Rioja (Bosq); 1 ♀, S/algodoneros danos no constat, S. Pena, 1-IV-1938 (Denier); 2 ♀, T. Formosa, Paso Angelito, S/el rio Porteno Lag, Nainec, 12-XII-1935 (Denier); 1 ♂, Tablillas, Salta, II-1945 (Martinez); 1 ♀, Concaran S. Luis, 16-III-1960 (Vidal S.—Trotta). In La Plata Museum, Museum of Comparative Zoology (Harvard), United States National Museum, J. A. Slater and R. C. Allen collections.

***Leptoglossus balteatus* (Linnaeus)**

Cimex balteatus Linnaeus, 1771:534.

Cimex auctus Fabricius, 1781:351.

Lygaeus auctus Fabricius, 1794:139.

Lygaeus balteatus Fabricius, 1794:142.

Anisoscelis fasciatus Herrich-Schaeffer, 1851:277.

Anisoscelis thoracicus Guerin, 1857:386.

Theognis schaefferi Mayr, 1866:102-3.

Leptoglossus auctus Stål, 1868:52.

Leptoglossus balteatus Stål, 1870:161-2.—Barber, 1939: 310-11.—

Barber and Bruner, 1947:80.—Wolcott, 1948:197.

Anisoscelis selecta Walker, 1871:127-8. NEW SYNONYMY.

Pronotum, scutellum, clavus and corium dark reddish brown with head above, outer areas of first antennal segments and pronotal calli piceous; medial portion of antennal segments two and three and apical half of fourth, a narrow band on posterior marginal area and two large well separated, longitudinal ovoid spots on disk of pronotum ochraceous, the latter interspersed with numerous small piceous spots; apex scutellum, straight transverse fascia on corium, large maculae on inner tibial dilations, and undilated portion of hind tibiae whitish yellow; head below and with three narrow stripes above, inner margin of first antennal segment with distal portion of segments two and three and apical half of fourth segment, basal and ventral portions of all femora, fore and middle tibiae entirely, and hind tibial dilations light reddish brown; dorsal portion of femora fuscous with teeth and tubercles piceous; thoracic and abdominal venter light to dark reddish brown with numerous small piceous spots frequently fusing to form larger maculae; connexivum and abdominal dorsum piceous with connexival sutures and medial area of dorsum broadly ochraceous; mem-

brane uniformly dark; pronotum, clavus and corium coarsely and closely punctate with surface above punctures uneven, scutellum transversely rugulose with small punctures; venter with dense short and appressed whitish hairs; clavus and corium with short semi-decumbent golden hairs and anterior half of pronotum with thick darker hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 2.64, width head 2.16, interocular distance 1.20, anteocular distance 1.32; pronotum abruptly declivent, lateral margins straight and entire, humeral areas slightly expanded with humeral angles spinose and obliquely ascending, postero-lateral margins serrate, calli prominently elevated with area between calli only slightly higher, disk posteriorly without a median longitudinal carina, length pronotum 3.04, width across humeri 5.76, width anterior margin pronotum 1.56; length scutellum 2.16, width scutellum 2.04; labrum reaching to anterior margin of fourth abdominal sternum, length labial segments I 2.76, II 2.52, III 1.44, IV 2.64; length antennal segments I 2.64, II 3.96, III 2.88, IV 4.56; hind tibiae with outer dilation phylliform with one shallow and two deep emarginations, occupying 63% length of hind tibiae, width about twice width of inner dilations; inner dilations lanceolate, shorter and with margin distally furnished with a few small spine-like teeth; undilated portion of hind tibiae armed inwardly with a double row of small spine-like teeth, length hind tibiae 8.40; length outer dilations 5.28, width outer dilations 1.92; length inner dilations 4.44, width inner dilations 0.84.

Claspers (Fig. 25) with prominent and rounded inner basal lobe, median lobe on shank rounded and well developed, hook strongly curved; capsule (Fig. 51) with median notch "V" shaped, dorsal prongs low and rounded almost obsolete, lateral margins flared and extending beyond curvature of capsule; aedeagus with dorsal sac of conjunctiva bearing paired sclerotized proximal lobes, two long similar median lobes present with tips slightly sclerotized, anterior distal lobe and two lateral distal lobes present with lateral lobes spinose, all three distal lobes heavily sclerotized; total length 17.3.

The above description is of a male specimen from Jamaica. The variation in color present is of a geographic nature. Specimens from the Bahamas, Cuba, and Jamaica have the two ochraceous pronotal spots rounded and well separated, the first antennal segment is unicolorous and the pubescence on the dorsum is generally pale and long. The specimens from Puerto Rico, Dominican Republic, and Haiti have pronotal spots that are larger, quadrate, and tending to spread out laterally and medially sometimes partially fusing together, the first

antennal segment is bicolored, and the pubescence appears to be short and sparse. Stål (1871) and Barber (1939) both mentioned the pronotal coloration, but neither stated the locality of specimens involved.

I have examined Walker's *selectus* from St. Domingo, and found it to be identical to *balteatus*. Walker probably described the species as new based on the difference in pronotal coloration since Linnaeus described *balteatus* from a Jamaican specimen. *Leptoglossus selectus* is here formally synonymized.

L. balteatus is closely related to *phyllopus* and can be distinguished from the latter by the pronotal coloration. Although some individuals of *phyllopus* may develop yellow pronotal spots, the margins of these spots are not well defined, but appear diffused. The lateral angles of *balteatus* are acute to subspinose and ascending, while those on *phyllopus* are subacute and only slightly turned up. The length of the outer tibial dilation is also of diagnostic value, in *phyllopus* this dilation extends 76–87% the length of the hind tibiae; in *balteatus* it varies between 63–70%. The unicolorous hind wing of *balteatus* is easily distinguished from the obviously bicolored hind wing of *phyllopus*. The median notch on the genital capsule and the basal portion of the claspers are essentially the same in the two species. In *balteatus* the lateral posterior margins are flared and project backwards over the curvature of the capsule, and the clasper has a well developed median lobe on the shank. The lateral margins on the capsule are not flared or prominent in *phyllopus* and the clasper has only a small median lobe. *L. balteatus* has been confused with *grenadensis* in the past, but the two species are quite distinct. The shape and color of the pronotum is almost identical except that in *grenadensis* the lateral angles are not quite so acute or ascending. The clavus and corium are more uniform in color and the transverse fascia on the corium is straight, while *grenadensis* has the claval area and the veins lighter in color than the rest of the corium, and the transverse fascia is distinctly angular. The difference in the genital capsule is very prominent, *grenadensis* has distinct dorsal prongs and *balteatus* (Fig. 51) has a simple margin, with prongs obsolete. The claspers and aedeagus also differ considerably.

L. balteatus has been reported as feeding on cotton, tomatoes, leguminous plants, oranges, and cowpeas (Barber and Bruner, 1947; Pagden, 1928). Barber and Bruner (1947) also state that it breeds on guava (*Psidium guajava* [sic] L.) and *Luffa* species.

Distribution: This species is present in the Greater Antilles, the Bahama Islands, and there is at least one record from Florida (Barber,

1914). The localities cited by Uhler (1893) were based on erroneous identifications (see discussion under *grenadensis*).

Material Examined: BAHAMA ISLANDS: 1 ♂, 1 ♀, New Providence, Nassau, July 1904 (Allen, Banbom, and Ronjant); 1 ♂, Andros Island, Fresh Creek, April 23, 1953, Van Voast, A.M.N.H. Bahama Island Exped. (E. B. Hayden, L. Giovannoli). JAMAICA: 5 ♂, 2 ♀, Torrington, July 18, 1960 (P. and C. Vaurie). CUBA: 1 ♀, vic. of Havana (T. Barbour); 1 ♂, 3 ♀, Habana (F. Z. Cervera); 1 ♀, Jaronu, V-13-31, "on weeds" (L. C. Scaramuzza); 1 ♂, Guane, Sept. 24-26, 1913; 1 ♀, Soledad, 20-II-1925 (J. G. Myers); 3 ♂, 3 ♀, Nov. 1874 (Gundlack); 1 ♀, no data. DOMINICAN REPUBLIC: 1 ♂, 1 ♀, San Jose de las Matas 1000-2000 ft., June 1938 (Darl.); 1 ♂, 2 ♀, Puerto Plata (Hurst). PUERTO RICO: 1 ♀, Humacao, July 1937 (J. Carrion); 1 ♀, Ensenada, June 14-19, 1915; 1 ♂, Nov. 1874 (Krug). SAINT THOMAS: 1 ♀, Angek, 19-1-1908 (L. Eggert); 2 ♂, 1 ♀, no data. In American Museum of Natural History, Museum of Comparative Zoology (Harvard), Berlin Humboldt University Museum, Stockholm Museum, University of Kansas (Snow collection), J. A. Slater and R. C. Allen collections.

***Leptoglossus phyllopus* (Linnaeus)**

Cimex phyllopus Linnaeus, 1767:731.

Lygaeus phyllopus Fabricius, 1794:139.

Anisoscelis albicinctus Say, 1831:326.

Anisoscelis phyllopa Westwood, 1842:16.

Anisoscelis fraterna Westwood, 1842:16.—Distant, 1901a:334.

Anisoscelis confusa Dallas, 1852:453.

Theognis phyllopus Mayr, 1866:103.—Hussey, 1953:32.

Leptoglossus albicinctus Stål, 1868:52.

Leptoglossus phyllopus Stål, 1870:161.—Distant, 1881:124, 361.—Lethierry and Severin, 1894:48.—Van Duzee, 1917:88.—Gibson, 1917:72.—Parshley, 1923:747.—Blatchley, 1926:225-26, fig. 46.—Deay, 1928:377.—Torre-Bueno, 1941:50.—Froeschner, 1942:594, 599.—Hussey, 1953:32.—Drew and Schaefer, 1963:114.

A medium sized species; uniformly dark chocolate brown on the dorsum with occasionally yellow spots on the pronotal disk; a straight whitish yellow transverse fascia on the corium, venter light to dark tan with numerous small piceous spots; hind wings prominently bi-colored, with the basal portion clear and the apical portion with a brownish tinge; hind tibiae with outer dilation phylliform usually with two deep emarginations. Genitalia similar to *balteatus*.

L. phyllopus and *balteatus* are closely related species as evidenced by the similarity of the genitalia and general color pattern. The absence of pronotal spots, possession of a bicolored hind wing, and sub-acute to rounded humeral angles will serve to distinguish *phyllopus* from *balteatus*. In general, *phyllopus* may be separated from any member of the *stigma*-group by the straight transverse fascia on the corium (*stigma*-group members either lack the corial fascia or if present, it is irregular not straight), the rounded median notch, and the absence of dorsal prongs on the genital capsule (*concolor* in the *stigma*-group lacks dorsal prongs; in this case the median notch is deeply rectangular in shape and not rounded). Specifically, *phyllopus* may be separated from both *concolor* and *oppositus* by the shorter labium, which usually does not extend past the second abdominal sternum, in *stigma* and *oppositus* the labium usually extends well onto the abdomen around the third and fourth sternum; and from *oppositus* by having at least the pronotal postero-lateral margins crenulate to serrate (*oppositus* has all lateral margins on the pronotum entire).

L. phyllopus, a very common insect in the southern United States, has been reported as a pest on a number of important agricultural crops, where occasionally large numbers of individuals inflict considerable damage. The following is a partial list of crops recorded as having been attacked by *phyllopus*: citrus fruits (Ebeling 1959, Watson and Berger 1932), peaches (Snapp 1948), sunflowers (Adams and Gaines 1950), cucumbers and squash (Kelsheimer 1949). Blatchley (1926) lists *phyllopus* as common on yellow-flowered thistle, *Cirsium horridulum* Michx. Schaefer (1965, 1968) describes some morphological aspects of *phyllopus* in his studies on the higher classification of the Coreoidea.

Distribution: A wide ranging species occurring as far north as New York, south to Florida, west to Iowa and Kansas, and southwest through Texas to Lower California and into Central America. I have seen specimens from as far south as Costa Rica, and Distant (1881) lists Panama and Brazil as well.

Material Examined: UNITED STATES: 191 ♂, 142 ♀, Alabama, Arkansas, California, Florida, Georgia, Iowa, Kansas, Louisiana, Mississippi, Missouri, Nebraska, North Carolina, Oklahoma, South Carolina, Texas, and Virginia. MEXICO: 1 ♂, Hidalgo, Tezontepec, 21 m. S.W. Actopan, 6600 ft. 27 August 1962 (Ordway and Marston); 2 ♂, Presisio (Forrer); 1 ♀, Salle, no data; 1 ♀, no data (Boucard). GUATEMALA: 1 ♂, 3 ♀, Olas de Moka, Dept. Solola, 3000, Sept. 1908. COSTA RICA: 1 ♂, Zarzero (Schild-Burgdorf); 1 ♀, San Jose (Schild-Burgdorf). In University of Kansas, Stockholm Museum,

Berlin Humboldt University Museum, United States National Museum, Iowa State University, Museum of Comparative Zoology (Harvard), American Museum of Natural History, Hungarian National Museum, California Academy of Sciences, J. A. Slater and R. C. Allen collections.

Leptoglossus ingens (Mayr)

Theognis ingens Mayr, 1865:434.—Mayr, 1866:108, fig. 26.

Leptoglossus ingens Stål, 1870:166.—Lethierry and Severin, 1894:48.

Anisoscelis santaremus Walker, 1871:129. NEW SYNONYMY.

Pronotal disk, scutellum, clavus and corium dark reddish brown with head above, outer margin of first antennal segment, humeral and lateral areas of pronotum and pronotal calli piceous; veins of clavus and corium wine red; apex scutellum, fourth antennal segment and maculae on inner tibial dilations dark yellow to ochraceous; head below and with three narrow stripes above, inner margins of first, second and third antennal segments, bases and ventral portions of all femora, fore and middle tibiae light reddish brown; dorsum of all femora and hind tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter light reddish brown with numerous small piceous spots frequently fusing to form larger maculae; connexivum and abdominal dorsum piceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate, surface above punctures largely even; scutellum transversely rugulose with few punctures; head, anterior half of pronotum, scutellum, and legs with rather dense long and erect yellowish pilosity; venter, clavus and corium with moderate amounts of short decumbent to semidecumbent yellowish hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, forming a rounded elevated ridge, slightly exceeding juga, length head 2.88, width head 2.64, interocular distance 1.44, anteocular distance 1.56; pronotum abruptly declivent with lateral margin entire and sinuate, humeral areas broadly and obliquely ascending, humeral angles subacute, postero-lateral margins serrate, disk posteriorly with median longitudinal carina obsolete, calli prominently elevated, area between slightly higher, length pronotum 3.68, width across humeri 8.00, width anterior margin pronotum 1.68; length scutellum 2.76, width scutellum 2.76; labium extending to posterior margin of third abdominal sternum, length labial segments I 3.12, II 2.88, III 1.80, IV 3.60; length antennal segments I 2.52, II 4.20, III 3.00, IV 5.40; hind tibiae with outer

dilations phylliform with one shallow and three deep emarginations, dilations very long, occupying 92% length of hind tibiae and width about twice width of inner dilations; inner dilations lanceolate considerably shorter, 55% length of outer, furnished with numerous small spine-like teeth on distal half of margins; inner margins of undilated portions of hind tibiae with two rows of many small spine-like teeth, length hind tibiae 10.8; length outer dilations 9.90, width outer dilations 2.76; length inner dilations 5.52, width inner dilations 1.32.

Claspers (Fig. 17) with lateral basal area only slightly bulbous with inner basal lobe long, thick and rounded, median lobe on shank very prominent, hook thick, blunt and not strongly curved; capsule (Fig. 41) with median notch deep and bottom of notch "V" shaped, dorsal prongs prominent, medial posterior margins mesally projecting slightly antero-dorsally; aedeagus (Fig. 67) with dorsal sac of conjunctiva bearing sclerotized proximal lobes, two median lobes of equal size and shape with tips slightly sclerotized; anterior distal lobes large, lateral distal lobes large and spinose, all distal lobes heavily sclerotized; total length 21.6.

The above description is of a male specimen from Caviuna, Parana, Brazil. This species has considerable color variation in that the pronotum may be entirely dark, or the anterior half before the humeri may be yellow, and the irregular transverse fascia on the corium may or may not be present. Specimens also vary from being uniformly piceous dorsally to a dark reddish brown. I have tentatively identified three female specimens from Olivenca, Brazil as *ingens* that have longer and more spinose humeral angles, but otherwise do not differ from typical *ingens* specimens.

I have examined the female holotype of *Leptoglossus santaremus* (Walker), from Santarem, Brazil, which is deposited in the British Museum (Natural History). I was unable to find any differences between it and *ingens* other than the fact that *santaremus* possesses a transverse fascia on the corium. Therefore, I am formally synonymizing *santaremus* with *ingens*. I should like to point out that all the specimens with a transverse fascia are more northern in distribution than the specimens without it. The results of additional collecting will probably establish these two forms as distinct but conspecific populations.

L. ingens may be distinguished from *macrophyllus* by its darker color, lack of the rectangular yellow fascia on the pronotum and by the presence of two equal sized median lobes on the dorsal sac of the conjunctiva. The wide, elongate outer tibial dilations will serve to distinguish both *macrophyllus* and *ingens* from other members of the genus.

Distribution: Brazil, Bolivia, Paraguay, and Argentina.

Material Examined: (Specimens with a corial transverse fascia): BOLIVIA: 3 ♂, Yungas de la Paz, 1000 m. (O. Garlepp); 1 ♂, same except (Linnaea V.); 1 ♂, Province Sara (Steinbach); 1 ♂, Buena Vista, Province Tchito, Dep. Santa Cruz, 400 m., 1956 (F. Steinbach); 1 ♂, 1 ♀, Rio Cristal Mavu, 50 mi. N.E. Cochabamba, XII-8-1949 (L. Pena); 1 ♀, Juntus, no data; 1 ♂, no data. BRAZIL: 1 ♂, 2 ♀, Amazon, sup. Olivença. PARAGUAY: 1 ♀, Horqueta, 57-10, W. 23-24 N., 44 kilm. East Paraguay Riv., 1-17-1935 (A. Schulze). Specimens without a corial transverse fascia: BRAZIL: 2 ♂, Caviuna, Parana, Feb. 1947 (A. Maller); 1 ♀, same except XI-1945; 1 ♀, Corupa (Hansa Humbolt), S. Cath., I-1946; 1 ♂, Nova Teutonia, Santa Catarina, IV-10-1948 (F. Plaumann). PARAGUAY: 1 ♀, Horqueta, 57-10, W. 23-24 N., 44 kilm. East Paraguay Riv., XII-18-1934 (Alberto Schulze); 1 ♀, same except 1-3-1936. In Stockholm Museum, Hungarian National Museum, Berlin Humboldt University Museum, Museum of Comparative Zoology (Harvard), American Museum of Natural History, J. A. Slater and R. C. Allen collections.

***Leptoglossus macrophyllus* Stål**

Leptoglossus macrophyllus Stål, 1870:162.—Lethierry and Severin, 1894:48.

Pronotal disk posteriorly, scutellum, clavus and corium bright reddish brown with head, first antennal segment, marginal areas of pronotum, calli, and claval sutures piceous; pronotal disk anteriorly with one large sharply defined rectangular transverse band, irregular transverse fascia on corium, and maculae on inner tibial dilations whitish yellow; inner margins of first, medial portions of second and third and the entire fourth antennal segments ochraceous, with proximal and distal portions and a narrow dorsal stripe on segments two and three fuscous; head laterally and with three narrow stripes above, fore and middle tibiae, and undilated portion of hind tibiae light reddish tan; basal half and ventral portions of all femora bright reddish brown with remainder of femora and tibial dilations dark reddish brown to fuscous; thoracic and abdominal venter dark reddish tan with numerous small piceous spots frequently fusing to form larger maculae; connexivum and abdominal dorsum fuscous to piceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures largely even; scutellum transversely rugulose with a few punctures; head, anterior half of pronotum, scutellum, appendages, and mid-venter with dense

golden pilose hairs; remainder of venter and clavus and corium with short appressed and semi-decumbent golden hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a low rounded ridge, length head 2.76, width head 2.40, interocular distance 1.32, anteocular distance 1.56; pronotum abruptly declivent with lateral margins entire and sinuate, humeral areas broadly rounded and only barely obliquely ascending, humeral angles sub-acute, postero-lateral margins crenulate, disk posteriorly with median longitudinal carina obsolete, calli prominently elevated, area between calli higher, length pronotum 3.36, width anterior margin pronotum 1.56; length scutellum 2.28, width scutellum 2.40; labium reaching to anterior margin of fourth abdominal sternum, length labial segments I 2.88, II 2.76, III 1.68, IV 3.00; length antennal segments I 2.40, II 3.84, III 2.88, IV 4.80; hind tibiae with outer dilations phylliform with one shallow and two deep emarginations, dilations very long, occupying 86% length of hind tibiae, width about twice that of inner dilations; inner dilations lanceolate, considerably shorter, 68% length of outer with a few small spine-like teeth on distal half of margins; inner margins of undilated portions of hind tibiae with a double row of small spine-like teeth; length hind tibiae 8.88, length outer dilations 7.68, width outer dilations 2.52; length inner dilations 5.58, width inner dilations 1.08.

Claspers (Fig. 16) with lateral basal area bulbous, inner basal lobe prominent, wide and rounded, median lobe on shank prominent and sharply curving back onto shank, hook thick, blunt, not strongly curved; capsule (Fig. 40) with median notch deep and bottom of notch "V" shaped, dorsal prongs prominent with inner margins straight, posterior medial margin projecting slightly antero-dorsad, aedeagus with dorsal sac of conjunctiva with sclerotized proximal lobes; unsclerotized median lobes present, left lobe short with right lobe much longer; large anterior distal lobe present, two lateral lobes large and spinose, all distal lobes heavily sclerotized; total length 19.4.

The following minor color variations were noted: four specimens have a narrow reddish stripe on the yellow pronotal band, with one individual having this band almost divided in two; the abdominal dorsum may be a rusty reddish brown instead of piceous; the scutellum occasionally piceous instead of a bright reddish brown.

L. macrophyllus closely resembles *ingens* in shape and size. The hind tibial dilations are identical, except that the outer dilation is a little longer in *ingens*. The difference in color between the two species is considerable. *Macrophyllus* is a brightly colored species and the yellow rectangular band on the pronotum will distinguish it from the

darker colored *ingens*. In *macrophyllus* the two unequal sized median lobes are present on the dorsal sac of the conjunctiva, in *ingens* the same lobes are of equal size and shape.

Distribution: Venezuela and Colombia.

Material Examined: Two syntypes: 1 ♂, 1 ♀, Bogota (Lindig), Colombia. In Stockholm Museum. The ♂ specimen bearing the label Allotypus is here selected as LECTOTYPE, and a label has been attached to the insect to this effect. VENEZUELA: 1 ♂, 3 ♀, Merida; 1 ♂, Rancho Grande nr. Maracay, 2-IX-1946; 1 ♀ (Breddin); 1 ♀, Carepilo, June, 1937 (Pablo J. Anduze). COLOMBIA: 1 ♂, 1 ♀, Villavicencio; 1 ♀, Villa Vincencio, 1919; 1 ♂, Caqueza, Cundinamarca, XII-8-39 (F. J. Otoy); 1 ♀, Aquadita, VI-1914. In United States National Museum, California Academy of Sciences, American Museum of Natural History, University of Kansas (J. R. de la Torre-Bueno collection), Stockholm Museum, Deutsches Entomologisches Institut, J. A. Slater and R. C. Allen collections.

***Leptoglossus conspersus* Stål**

Theognis vexillatus, 1866 (*nec* Stål):101.

Leptoglossus conspersus Stål, 1870:163.—Lethierry and Severin, 1894:47.

Pronotum posteriorly dark chocolate brown; anterior portion of corium dark reddish brown with scutellum, clavus, apex corium, and veins contrasting bright reddish brown; head, first two antennal segments and pronotal calli piceous; two large medially separated yellowish orange areas interspersed with numerous small piceous spots on pronotum, these light areas occupying almost the entire pronotal disk, extending laterally to margins and obliquely ascending posteriorly to include anterior half of humeral areas; fourth antennal segments and a wide irregular transverse fascia on corium whitish yellow; head below and with three narrow stripes above, basal portion of third antennal segments, small scattered maculae on outer tibial dilation and larger maculae on inner dilations light reddish tan; all legs and tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter light reddish tan with numerous small piceous spots frequently fusing to form larger maculae; connexivum and abdominal dorsum fuscous to dark reddish brown with anterior portion of each connexival segment light reddish brown; membrane uniformly dark; pronotum, clavus and corium closely and finely punctate, surface above punctures largely smooth; scutellum transversely rugulose with numerous small punctures; dorsum with short semi-decumbent golden hairs, with head behind eyes, anterior half of pronotum and

appendages more densely clothed with longer pilose hairs; venter with short erect and appressed whitish hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga, forming a rounded elevated ridge, length head 2.16, width head 2.04, interocular distance 1.08, anteocular distance 1.08; pronotum abruptly declivent with lateral margins entire and barely sinuate, humeral areas not strongly produced and humeral angles sub-acute, postero-lateral margins finely serrate, posterior pronotal disk with an obsolete median longitudinal carina, calli prominently elevated, area between calli slightly higher and with two small tubercles, length pronotum 2.40, width across humeri 4.32, width anterior margin 1.32; length scutellum 1.80, width scutellum 1.92; labium reaching to middle of third abdominal sternum, length labial segments I 2.16, II 2.04, III 1.08, IV 1.92; length antennal segments I 2.16, II 3.12, III 2.40, IV 4.44; hind tibiae with outer dilation phylliform with one shallow and two deep emarginations and occupying 74% length of hind tibiae; width outer dilation about twice width of inner dilations; inner dilations shorter and lanceolate with margins distally furnished with a few small spine-like teeth; undilated portion of hind tibiae armed inwardly with several small teeth in a double row, length hind tibiae 7.56; length outer dilations 5.44, width outer dilations 1.80; length inner dilations 4.32, width inner dilations 0.84.

Clasper (Fig. 20) with bulbous lateral margins on base and inner basal lobe very prominent, shank thick with median lobe hardly evident, hook strongly curved with a small knob on outer curvatures; capsule with median notch deeply rounded with dorsal prongs strongly produced and acute; aedeagus with dorsal sac of conjunctiva with sclerotized proximal lobes; median lobes present with left and right lobes bifid; anterior distal lobe large and heavily sclerotized, lateral lobes spinose and heavily sclerotized; total length 14.4.

In the type series two females are darker and have a more uniform color to the clavus and corium. The labium varies in length from the posterior margin of the metasternum to the third abdominal sternum.

L. conspersus is closely allied to *grenadensis*, having darker and lighter reddish tan areas on the clavus and corium and similar genitalia, but differing in that *conspersus* has large diffused pronotal markings, a longer and wider outer tibial dilation, more blunt and less elevated humeral angles, and (although not completely diagnostic) the labium is generally shorter. The following characters will separate *conspersus* from *zonatus*, *neovexillatus*, and *impictipennis*: large pronotal spots occupying most of disk, a more or less bicolored clavus and corium; clasper (Fig. 20) with a long inner basal lobe and a more

blunt median lobe on the shank; a very large heavily sclerotized anterior distal lobe on the dorsal sac of the conjunctiva and the right median lobe bifid.

Distribution: Colombia and Brazil.

Material Examined: Four syntypes: 1 ♂, 3 ♀, Bogota, Colombia (Lindig). In Stockholm Museum. The ♂ specimen (described above) bearing the "Typus" label is here selected as LECTOTYPE and an appropriate label attached to the specimen. One additional specimen was available for study, a ♂ from Minas Geraes, Brazil, also in the Stockholm Museum.

***Leptoglossus grenadensis* new species**

(Fig. 3)

Leptoglossus balteatus Uhler, 1893 (*nec. L.*):705.

Leptoglossus zonatus Uhler, 1894 (*nec. Dallas*):178.

Leptoglossus balteatus Distant, 1901b (*nec. L.*):417 (pt.).

Pronotum, scutellum, and corium dark reddish brown with clavus a light reddish tan; head above, pronotal calli and humeral angles piceous; irregular transverse fascia on corium, posterior sub-marginal area and two large separated longitudinally ovoid spots on disk of pronotum, apex scutellum, and maculae on inner tibial dilations whitish to dark yellow; head laterally and with three narrow stripes above, medial area of antennal segments two and three and entire fourth segments light reddish tan; legs light reddish brown with femora distally, tibial dilation, entire first antennal segment and basal and distal portions of second and third segments fuscous; femoral and tibial teeth and tubercles piceous; thoracic and abdominal venter ochraceous, mottled with numerous small piceous spots occasionally fusing to form larger maculae; connexivum and abdominal dorsum piceous with anterior third of connexival segments and intersegmental sutures on dorsum ochraceous; membrane uniformly dark; pronotum, clavus and corium coarsely and closely punctate with surface above punctures on pronotum uneven; scutellum transversely rugulose with few small punctures; venter densely clothed with short appressed whitish pubescence; dorsum with short semi-decumbent golden pubescence with head behind eyes, anterior portion of pronotum, scutellum, and legs also with longer pilose hairs.

Head non-declivent with tylus and jugs above level of antenniferous tubercles, tylus blunt, slightly longer than jugs and forming a low rounded elevated ridge, length head 2.40, width head 2.16, interocular distance 1.20; antocular distance 1.32; pronotum abruptly declivent with lateral margins entire and straight, humeral areas not

expanded with humeral angles acute and obliquely ascending, postero-lateral margins serrate, calli prominently elevated with area between calli slightly higher, disk posteriorly without a median longitudinal carina, length pronotum 2.88, width across humeri 5.12, width anterior margin pronotum 1.44; length scutellum 2.04, width scutellum 2.04; labium reaching to anterior margin of fourth abdominal sternum, length labial segments I 2.52, II 2.40, III 1.32, IV 2.52; length antennal segments I 2.52, II 3.84, III 2.88, IV 4.68; hind tibiae with outer dilations phylliform and with two deep emarginations occupying 62% length of hind tibiae, width of outer dilations about twice width of inner dilations; inner dilations slightly shorter, lanceolate with entire margin furnished with many small spine-like teeth; undilated portion of hind tibiae inwardly with a double row of small spine-like teeth, length hind tibiae 7.80; length outer dilations 4.80, width outer dilations 1.44; length inner dilations 4.20, width inner dilations 0.84; genitala as in *conspersus*; total length 15.5.

The following variations were noted in the type series: some individuals with pronotum, clavus and corium a light red brown and yellowish orange areas not so strongly contrasting as in dark red brown individuals; low obscure longitudinal carina on pronotal disk evident on many specimens; scutellum varying from black to red brown and first antennal segment having a prominent inner light stripe; variation in extension of labium from the middle of third to posterior margin of fourth abdominal sternum, one specimen has labium extending to posterior margin of fifth sternum.

The diagnostic characters which separate *grenadensis* from its most closely related species, *conspersus*, are as follows: the pronotal coloration in *grenadensis* is two well defined yellow ovoid spots and a pale posterior sub-marginal area, in *conspersus* these pronotal spots are large and diffuse, occupying most of the pronotum anteriorly, and the posterior sub-marginal area is concolorous with the rest of the dark ground color of the pronotum. *L. grenadensis* has acute, elevated humeral angles, whereas in *conspersus* these angles are more rounded and barely ascending. The length of the outer dilation is smaller in *grenadensis*, occupying 61–64% of the length of hind tibiae, while that of *conspersus* is 74–81% the length of hind tibiae. From *balteatus*, *grenadensis* differs chiefly in that it has dorsal prongs on the capsule and an irregular transverse fascia on the corium.

Distribution: *L. grenadensis* was first reported from St. Vincent by Uhler (1893) as *L. balteatus*. Uhler (1894) again reported it as *L. zonatus* occurring on the island of Grenada. Both of these papers pertain to the collection made by H. H. Smith. Distant (1901b) after seeing the H. H. Smith collection (now in the British Museum) re-

ferred to all the specimens of this species from Grenada as *L. balteatus*. I have seen seven specimens from the British Museum that bear the labels of the H. H. Smith collection, and these are definitely *grenadensis*.

HOLOTYPE: ♂. **GRENADINES:** Grenada, Balthazar, windward side (H. H. Smith). In United States National Museum, type no. 70225.

PARATYPES: **GRENADINES:** 1♂, 1♀, Mustique I. (H. H. Smith); 1♂, 2♀, Becquia I. (H. H. Smith); 3♀, Grenada (H. E. Summers); 1♀, Grenada, 8-25-1891 (H. E. Summers); 1♂, 1♀, Grenada, St. Georges, Aug. 1910 (Allen and Brues); 1♀, Grenada, Santeurs, Sept. 1910 (Allen and Brues); 1♂, Grenada, Mount Gay Est. leeward side (H. H. Smith); 1♂, Grenada, Lake Antoine Est. windward side (H. H. Smith); 1♂, 1♀, St. Vincent, Yambu River Valley, 10-3-31, "on guava" (M. Kisliuk, C. E. Cooley); 1♂, 1♀, same except 10-2-31; 1♂, no data. In United States National Museum, Museum of Comparative Zoology (Harvard), Iowa State University, British Museum (Natural History), and J. A. Slater collections.

***Leptoglossus zonatus* (Dallas)**

Anisoscelis zonata Dallas, 1852:452.

Anisoscelis vexillatus Stål, 1855:185. NEW SYNONYMY.

Theognis zonatus Stål, 1862:295.

Theognis vexillatus Stål, 1862:295.

Leptoglossus zonatus Stål, 1870:162.—Distant, 1881:125, 361, pl. 12, fig. 16.—Lethierry and Severin, 1894: 49.—Van Duzee, 1917:88.—Gibson, 1917:72.—Torre-Bueno, 1941:50-1.

Leptoglossus vexillatus Stål, 1870:162.—Lethierry and Severin, 1894: 49.

Pronotum, scutellum, clavus and corium dark chestnut brown with head above, outer marginal areas of first antennal segment, pronotal calli and marginal areas of humeri piceous; apex scutellum, wide irregular transverse fascia on corium, larger maculae on inner tibial dilations and two large well separated distinctly longitudinal ovoid spots on pronotal disk whitish yellow, the latter interspersed with numerous small piceous spots; basal three fourths of antennal segments two and three and entire fourth antennal segments light reddish brown with inner margins of first somewhat darker and distal portion of second and third fuscous; head below and with three narrow stripes, above reddish brown; fore, middle and undilated portion of hind tibiae, all tarsi, basal and ventral portions of femora and small

scattered maculae on outer tibial dilation light brown to reddish brown; distal portion of femora dorsad and tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter variegated dark and light brown with numerous small piceous spots frequently fusing to form irregular maculae; connexivum and abdominal dorsum piceous with anterior fourth of connexival segments and narrow areas around intersegmental sutures yellow; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures smooth; scutellum transversely rugulose with numerous small punctures; venter thickly clothed with short appressed whitish pubescence, and sparse short erect hairs; legs, anterior portion of pronotum and scutellum with more dense, longer and erect pale pilose hairs; dorsum with semi-decumbent whitish hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge; length head 2.88, width head 2.64, interocular distance 1.44, antocular distance 1.56; pronotum abruptly declivent, lateral margins only slightly sinuate and entire, humeral areas moderately expanded, not obliquely ascending, humeral angles small sub-acute, postero-lateral margins serrate, calli prominently elevated, area between calli only slightly higher, disk posteriorly with median longitudinal carina obsolete, length pronotum 3.36, width across humeri 6.56, width anterior margin pronotum 1.68; length scutellum 2.52, width scutellum 2.64; labium reaching middle of fourth abdominal sternum, length labial segments I 3.24, II 3.12, III 1.80, IV 3.36; length antennal segments I 3.12, II 4.80, III 3.36, IV 4.68; hind tibiae with outer dilations phylliform with one shallow and two deep emarginations, occupying 72% length of hind tibiae, width about twice width of inner dilations; inner dilations lanceolate, slightly shorter than outer, distally furnished with numerous small spine-like teeth along margins; inner margins of undilated portions of hind tibiae with a double row of small spine-like teeth, length hind tibiae 10.1; length outer dilations 7.20, width outer dilations 2.40; length inner dilations 6.00, width inner dilations 1.20.

Claspers (Fig. 18) with inner basal lobe strongly produced and rounded, shank with median lobe prominent and rather sharply curving back onto shank, hook strongly curved and outer curvature with a small knob, capsule (Fig. 42) with median notch deeply rounded, dorsal prongs prominently acute and projecting medially; aedeagus with dorsal sac of conjunctiva as follows: proximal lobes sclerotized; median lobes present, left median lobe short with tip sclerotized and a longer thin lobe arising from its base, right median lobe longer and wider, anterior distal lobe small and closely appressed to wall of sac,

one distal lateral lobe large and spinose the other smaller and more blunt, all three distal lobes strongly sclerotized; total length 20.8.

The description is of a male specimen from Yucatan, Mexico.

In the large series of specimens examined there is a considerable amount of variation present. Individuals will vary from light brown to dark brown. The transverse fascia is typically a wide irregular band, but some specimens have the narrow band confined to the area of the veins. Two individuals lack the band. There is considerable variation in the width of the outer dilation on the hind tibiae. The labium varies in length from the anterior margin of the second sternum to the posterior margin of the fourth.

Stål distinguished *vexillatus* from *zonatus* on the basis of its smaller hind tibial dilations and because there were only two emarginations or "teeth" on the margin of the outer dilation. At that time, *zonatus* was known only from Mexico and typical *zonatus* specimens from Mexico have a considerably wider dilation and usually possess one shallow and two deep emarginations. After examining a large series of specimens, I feel Stål's type series of *vexillatus* represents the smaller extreme of variation present in *zonatus*. The color pattern and other external characters as well as male genitalia are identical for these two taxa. I am at this time formally synonymizing *vexillatus* with *zonatus*. Stål's syntype series from Colombia consists of four specimens with the following labels: 2 males, Bogota (Lindig); 1 male, no data; 1 female, Remedios. These are deposited in the Stockholm Museum. The male specimen bearing the "typus" label is selected as LECTOTYPE with an appropriate label attached.

L. zonatus is closely related to *impictipennis* and *neovexillatus*, and may be distinguished from the former by its lack of serrate lateral margins on the pronotum and from the latter by the less steeply declivent pronotum, straighter lateral margins and humeral areas that are almost horizontal, not obliquely ascending. The aedeagus is distinct from both *impictipennis* and *neovexillatus* in that the short left median lobe has a secondary appendage. The following characters, although less reliable are worth stating because of their slight variability: *zonatus* is generally a larger species; the labium usually reaches to the fourth abdominal sternum; the pronotal disk has two large distinctly ovoid spots; the transverse fascia on the corium is usually a wide, brightly pigmented band, only five specimens out of 143 examined lacked this fascia.

L. zonatus has been reported to feed on oranges, watermelons, dates, and cotton (Cockerell 1905). It is also known to transmit the heart rot of pomegranates (Burgess and Hawkins 1945).

Distribution: Lower California and southwestern United States, through Central America and into the northern half of South America.

Material Examined: 51 ♂, 92 ♀. *California:* Calexico, Canipole; San Jose del Cabo; San Diego; Pasadena; Angeles Bay, San Pedro; Imperial Valley; Santa Cruz; El Marmol. *Arizona:* Huachuca Mts.; Tucson; Phoenix; Yuma Co.; Patagonia; Whetstone Mts. *Texas:* Davis Mts. MEXICO: Puebla; Antiguo; Morelos; Cuernavaca; Jalapa; Salle; Tepie; Sinaloa, Los Mochis; Oaxaca, Oax.; Tehuantepec; Mazatlan; Telmantepec; L. Chapata; Cyn Sapopa, Sonora; Chilpancingo; Vera Cruz; Hoege; Jacaia Hidalgo; Yucatan; Tesopaco; Baja California; Las Parras. GUATEMALA: Antigua; S. Gerocimo; Los Amates. HONDURAS: no locality. EL SALVADOR: San Miguel. NICARAGUA: La Calera; Managua. COSTA RICA: Palmer, Dept. Puntarenas; Turrialba; San Jose. PANAMA: Porto Bello; Boquete; La Campana; V. de Chiriqui; Bugaba; Cerro Zunil. VENEZUELA: Merida; Pts. Cavello. COLOMBIA: Villavicencio; Cali; Villa Vieja. ECUADOR: Paramba. PERU: Satipo; Monson Valley, Tingo Maria; Cumbase; Selipo; Tarapoto. BOLIVIA: Rurrenabaque Beni; Province Sara; Rio Cristal Mavu, N.E. Cochabamba. BRAZIL: Amazon; Olivenca. In Museum of Comparative Zoology (Harvard), California Academy of Sciences, Stockholm Museum, United States National Museum, American Museum of Natural History, Iowa State University, British Museum (Natural History), Berlin Humboldt University Museum, J. A. Slater and R. C. Allen collections.

***Leptoglossus neovexillatus* new species**

Pronotum, scutellum, clavus and corium dark reddish brown with head above, outer areas of first antennal segments, pronotal calli, and marginal areas of humeri piceous; two large poorly defined ovoid spots on pronotal disk yellow, interspersed with numerous small dark brown to piceous maculae; apex scutellum, narrow irregular transverse fascia on corium confined to veins, maculae on inner and outer tibial dilations, and undilated portion of hind tibiae whitish yellow; head below and with three narrow stripes above, inner margins of first antennal segment, entire second and third with distal portion slightly darker and fourth segments with apex somewhat darker, entire fore and middle legs ochraceous to light tan; distal three fourths of hind femora and tibial dilations fuscous with bases and ventral portion of femora light reddish brown; femoral and tibial teeth and tubercles piceous; thoracic and abdominal venter tan to light brown with numerous small piceous spots frequently fusing to form larger maculae; connexivum fuscous and abdominal dorsum piceous with anterior third of con-

nexival segments and intersegmental sutures whitish yellow; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures uneven; scutellum transversely rugulose with few punctations; venter rather thickly clothed with short appressed whitish pubescence and sparse short erect hairs; legs also with more dense longer and erect pale pilose hairs; dorsum with short semi-decumbent golden hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 2.40, width head 2.16, interocular distance 1.20, anteocular distance 1.32; pronotum steeply declivent, almost vertical, lateral margins sinuate, entire, humeral area moderately expanded, rounded and obliquely ascending, humeral angles small sub-acute, postero-lateral margins barely serrate, calli prominently elevated, area between calli only slightly higher, disk posteriorly with median longitudinal carina obsolete, length pronotum 1.92, width across humeri 3.60, width anterior margin pronotum 1.44; length scutellum 1.90, width scutellum 1.90; labium reaching posterior margin of second abdominal sternum, length labial segments I 2.16, II 1.92, III 1.20, IV 1.92; length antennal segments I 2.40, II 3.48, III 2.40, IV 4.08; hind tibiae with outer dilations phylliform with one shallow and two deep emarginations, dilations occupying 68% length of hind tibiae, width about twice width of inner dilations; inner dilations lanceolate, slightly shorter than outer, with numerous small spine-like teeth along margins; inner margin of undilated portion of hind tibiae with a double row of small spine-like teeth, length hind tibiae 7.80; length outer dilations 5.28; width outer dilations 1.92; length inner dilations 4.44, width inner dilations 0.84.

Clasper and capsule as in *zonatus*; aedeagus with dorsal sac of conjunctiva as follows: sclerotized proximal lobes present; medial lobes present with left lobe small and thin, right lobe longer and wider; sclerotized anterior distal lobe present and not appressed to wall of sac; one lateral distal lobe modified into a long spine, the other obsolete, both sclerotized; total length 15.5.

There is a considerable amount of color variation in the type series. Specimens vary from light brown to a dark reddish brown. The irregular transverse fascia on the corium can be a sharply outlined and brightly pigmented stripe or it can be completely lacking, as well as with all intermediate conditions. The yellow pronotal markings vary from two well defined spots to a broad uninterrupted band occupying the entire anterior pronotal area. Four specimens of the 51 examined have this yellow pronotal pattern reduced to small maculae. The labium varies in length from the anterior margin of second to anterior

margin of fourth abdominal sternum (only seven species possess labia that pass the posterior margin of the second sternum).

Specimens of *neovexillatus* have been misidentified as *vexillatus* because many of the males have a narrower and double "toothed" tibial dilation. *L. neovexillatus* may be distinguished from *zonatus* by its generally smaller size, the almost vertical declivity of the pronotum, the more strongly sinuate pronotal lateral margins, the more rounded and obliquely ascending humeral angles, the generally shorter labium and the dorsal sac of the conjunctiva with the left median lobe simple and without any secondary appendages, and one distal lateral lobe being obsolete. It may be distinguished from *impictipennis* by its non-serrate lateral pronotal margin and by the unequal sized lateral lobe on the dorsal sac of the conjunctiva.

HOLOTYPE: ♂. Brazil: Corumba, Acc. No. 2966, March. In Carnegie Museum.

PARATYPES: PERU: 1 ♂, Bella Vista, San Martin, Dec. 8, 1946, "alt. 1500 ft." (J. C. Pallister); 1 ♂, Vilcanota, no data (J. M. Bosq). BRAZIL: 1 ♂, Corupa (Hansa Humbolt), S. Cath., I-1945 (A. Maller); 1 ♀, same except I-1946; 1 ♀, same except XI-1945; 1 ♀, Nova Teutonia, Santa Catarina, XII-7-1948 (F. Plaumann); 1 ♂, 1 ♀, same except I-II-1949; 1 ♂, 1 ♀, Rio Grande, no data; 1 ♂, Parana, Tibagy (V. Konigswald); 1 ♂, no data; 2 ♀, Loreto, Misiones, II-XII-1941 (Biraben-Bezzi); 1 ♀, San Ignacio Misiones, 8-XII-1941 (Biraben-Bezzi); 1 ♀, Corumba, Acc. No. 2966, March, "lowland"; 1 ♀, same except April, "highland"; 1 ♂, 1 ♀, Matto Grosso, 96-204 (Spencer Moore); 1 ♀, Bahia, Iguassu, Sv. Amaz. Exp., 22 Aug. (Roman); 1 ♂, Curitiba, Para., "on berries of *Schinus terebinthifolius*" III-1954 (N. L. H. Krauss); 1 ♀, Bilbao, 1904. BOLIVIA: 1 ♂, 1 ♀, 1904-311 (J. Steinbach); 1 ♂, Prov. Sara (Steinbach). PARAGUAY: 1 ♂, Horqueta, XII-26-33 (Al. Schulze); 1 ♀, V. Encarracion, 2-III (F. Schade); 1 ♂, Rio Apa, Dto Carlos entre, Punta Apa y, Bellavista, 5-XII-1935 (Denier). URUGUAY: 1 ♀, Minas Geraes, no data; 1 ♀, Colonia Benitez Chaco, 1-V-1939 (Denier). ARGENTINA: 2 ♂, 1 ♀, Province Salta 2500 m. (J. Steinbach S.V.); 1 ♀, Province Salta, 2.05 (J. Steinbach S.V.); 1 ♂, 1 ♀, Salta las Canas, III-1938; 1 ♂, Fab. Chaco, 22-X-1899 (S. Venturi); 1 ♀, S. Tome, Corrientes; 1 ♀, Guemes Salta, #45 (Martinez-Bezileg); 1 ♀, Salta; 1 ♂, Jujuy; 3 ♀, Prov. of Buenos Aires (J. Bosq); 1 ♂, Prov. Tucuman, 7-IX-1900; 1 ♂, Tucuman, 11-13-1918, Est. Expt. Agric. No. 1307; 1 ♀, Tucuman, no data; 1 ♀, Bob. de Misiones (J. M. Bosq); 1 ♀, no locality (J. M. Bosq). In the American Museum of Natural History, United States National Museum (J. C. Lutz collection), Hungarian National Museum, La Plata Museum, Stockholm Museum, Berlin

Humboldt University Museum, Carnegie Museum, British Museum (Natural History), California Academy of Sciences, Museum of Comparative Zoology (Harvard), J. A. Slater and R. C. Allen collections.

***Leptoglossus impictipennis* Stål**

Leptoglossus impictipennis Stål, 1870:163.—Lethierry and Severin, 1894:47.

Pronotum, clavus and corium rusty reddish brown with scutellum fuscous; head, pronotal calli and margins of humeri piceous; two indistinct and partially separated ovoid spots on pronotal disk ochraceous and interspersed with numerous small piceous spots; apex scutellum and maculae on inner tibial dilations whitish yellow; head laterally and with three narrow stripes above, all antennal segments with the fourth segments somewhat lighter, and all legs light reddish brown; dorsum of hind femora distally and tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter dark reddish brown with numerous small piceous spots frequently fusing to form larger maculae; connexivum fuscous with anterior fourth of each segment ochraceous; abdominal dorsum piceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures largely smooth; scutellum transversely rugulose with few punctures; body above and below with moderate amounts of short pale erect and semi-decumbent hairs; thoracic and abdominal mid-venter, legs, head dorsally and anterior portion of pronotum with more dense long pilose hairs.

Head porrect with tylus and juga raised above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 2.04, width head 1.92, interocular distance 1.08, anteocular distance 1.20; pronotum abruptly declivent with lateral margins almost straight and serrate caudally, humeral areas not expanded, humeral angles acute and obliquely ascending, postero-lateral margins serrate, calli prominently elevated with area between calli only slightly higher, disk posteriorly with median longitudinal carina obsolete, length pronotum 2.24, width across humeri 4.96, width anterior margin pronotum 1.44; length scutellum 1.80, width scutellum 1.92; labium reaching to anterior margin of fourth abdominal sternum, length labial segments I 1.92, II 1.92, III 1.20, IV 2.16; length antennal segments I 2.04, II 3.24, III 2.16, IV 3.48; hind tibiae with outer dilations phylliform with one shallow and two deep emarginations, dilations occupying 77% length of hind tibiae, width about twice width of inner dilations; inner dilations lanceolate slightly shorter than outer, with numerous small spine-like teeth along

margins; inner margins of undilated portions of hind tibiae with a double row of small spine-like teeth, length hind tibiae 7.44; length outer dilations 5.76, width outer dilations 1.80; length inner dilations 5.04, width inner dilations 0.72.

Claspers (Fig. 19) with median basal lobe very small, rounded, shank with median lobe prominent, rounded hook gradually curved; capsule (Fig. 43) with median notch deep, dorsal prongs prominent, rounded, and wide; aedeagus with dorsal sac of conjunctiva as follows: proximal lobes present and sclerotized; medial lobes present, right lobe large and wide, left lobe smaller and thin; sclerotized anterior distal lobe not closely appressed to wall of sac; lateral distal lobes present, of same size and shape, both sclerotized; total length 14.4.

Stål described *impictipennis* on the following characters: shorter labium and antennae, and lack of the transverse fascia. Among Stål's four male syntypes there are three specimens that I feel belong to *L. zonatus*. They have similarly shaped pronotum and genitalia as do typical *zonatus* specimens. The remaining male syntype (labeled "Typus") is here selected as LECTOTYPE and an appropriate label attached. This specimen differs from the others in the type series and *zonatus* by the following characters: lateral margins serrate and almost straight; humeral areas not rounded but forming an acute humeral angle; left medial lobe on dorsal sac of conjunctiva a simple, long, and thin unsclerotized appendage. Additional characters which may be less reliable are as follows: the pronotal markings are not such clearly defined spots as in *zonatus* and are only partially separated medially; the basal median lobe on the clasper is lower and the median lobe on the shank is not so prominent.

I have assigned to this species 13 other specimens that have *impictipennis* characters, but differ in having wider tibial dilations, a clasper similar to *zonatus* and a capsule with dorsal prongs projecting vertically. There is also a considerable amount of short incumbent pubescence on the posterior portion of the corium, this is barely evident on the type specimen. Two females in this series have the entire anterior half of the pronotum yellow, and without the small black spots. Until a larger series of *impictipennis*-like individuals can be assembled, I do not feel justified in assigning these specimens to a new species.

All of the *impictipennis* specimens differ from *neovexillatus* by the presence of serrate lateral margins on the pronotum and the lateral distal lobes on the dorsal sac of the conjunctiva are both spinose and of the same size. In *neovexillatus* only one lateral distal lobe is spinose, the other is obsolete.

Distribution: Brazil, Bolivia, British Guiana, and Colombia.

Material Examined: Holotype. ♂. Colombia: Bogota (Lindig). In Stockholm Museum. BRITISH GUIANA: 1 ♂, no locality, B.M. 1948-60 (Bartlett). BOLIVIA: 3 ♂, Province Sara (Steinbach). BRAZIL: 2 ♀, Chapada, Acc. No. 2966, March; 1 ♀, same except June; 2 ♀, same except Nov., 1 ♂, same except April; 1 ♀, Matto Grosso (Zobrys & Wolter); 1 ♀, Corumba, Matto Grosso, 1950 (H. G. Barber); 1 ♀, Maracaju, M. Grosso, Feb. 1937 (R. C. Shannon); 1 ♂, Matto Grosso (Kolowsky). In Museum of Comparative Zoology (Harvard), British Museum (Natural History), United States National Museum, La Plata Museum, Berlin Humboldt University Museum, and Carnegie Museum.

***Leptoglossus concolor* (Walker)**

Anisoscelis concolor Walker, 1871:128.

Leptoglossus concolor Distant, 1881:124.—Lethierry and Severin, 1894:47.—Distant, 1901b:430.

Pronotum, scutellum, clavus and corium dark chestnut brown with head, outer margins of first antennal segments, pronotal calli, and margins of humeri piceous; fourth antennal segments, apex scutellum, wide irregular transverse fascia on corium, maculae on inner tibial dilations and undilated portion of hind tibiae whitish yellow; head laterally and with three narrow stripes above, inner margins of first segment and segments two and three of antennae, fore and middle legs except distal fourth of femora above, basal third and ventral area of hind femora reddish tan; distal portion of all femora above and hind tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter light reddish tan mottled with numerous small piceous spots frequently fusing to form larger maculae; connexivum and abdominal dorsum piceous with anterior fourth of each connexival segment and narrow intersegmental sutures on dorsum ochraceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures smooth; scutellum transversely rugulose with numerous small punctures; venter with moderate amounts of short appressed whitish pubescence, and sparse short erect hairs; legs and scutellum also with more dense longer pilose hairs; dorsum with short semi-decumbent golden hairs and pronotum anteriorly in area of calli with thicker dark almost spinose hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 3.00, width head 2.64, interocular

distance 1.32, anteocular distance 1.68; pronotum abruptly declivent, lateral margins slightly sinuate, entire, humeral areas moderately expanded, barely ascending, humeral angles sub-acute, postero-lateral margins serrate, calli prominently elevated with surface rough, area between calli slightly higher, disk posteriorly with median longitudinal carina obsolete, length pronotum 3.68, width across humeri 6.72, width anterior margin pronotum 1.80; length scutellum 2.64, width scutellum 2.52; labium reaching to middle of fourth abdominal sternum, length labial segments I 3.72, II 3.60, III 2.04, IV 4.80; length antennal segments I 3.12, II 5.40, III 3.84, IV 6.36; hind tibiae with outer dilations phylliform with one shallow and two deep emarginations, occupying 77% length of hind tibiae, width about two and one half times width of inner dilations; inner dilations lanceolate, slightly shorter than outer, and distally furnished with numerous small spine-like teeth, inner margins of undilated portions of hind tibiae with few small spine-like teeth arranged in a double row, length hind tibiae 11.3; length outer dilations 8.64, width outer dilations 3.00; length inner dilations 7.44, width inner dilations 1.20.

Claspers (Fig. 22) with inner basal lobe low and rounded; shank with median lobe prominent, gradually curving back onto shank, hook strongly curved; capsule (Fig. 44) with median notch deep, rectangular, no dorsal prongs; aedeagus with dorsal sac of conjunctiva as follows: proximal lobes present and sclerotized; median lobes present, left lobe short blunt and simple, right lobe longer and wide; sclerotized anterior distal lobe closely appressed to wall of sac; one distal lateral lobe sclerotized, large and spinose, the other lobe absent; total length 21.0.

The above description is of a male specimen from Chuminopolis, Yucatan, Mexico.

A generally uniform color pattern is present in the series before me. Lighter and darker individuals do occur, also there is variation in the appearance of the transverse fascia on the corium: of the 83 specimens examined, 22 have the fascia narrow, confined to the veins; two, including the type, have the fascia completely lacking; the remaining specimens have a wide and brightly pigmented fascia. The labium extension varies from the anterior portion of the fourth to the anterior portion of the sixth abdominal sternum. Fifteen specimens from the Caribbean have, on the posterior portion of the pronotal disk, a large yellow rectangular area, and the posterior marginal area of the pronotum is also yellow. This is quite unlike any other specimens of *concolor*, all of which have a unicolorous pronotum.

Previous to this revision, all specimens with phylliform tibial dilations and a pronotum without yellow spots had been referred to as

stigma. After dissecting the male genitalia of a number of specimens, it was apparent that two distinct species were represented. The type of *stigma* was described from Surinam. I have referred to *stigma* all specimens with dorsal prongs on the genital capsule, and to *concolor* the specimens with a rectangular notch on the capsule.

Externally, these two species are extremely close and the only characters, other than male genitalia, which distinguish *concolor* from *stigma* are the roughness of the pronotal calli, the thicker spinulose hairs around the calli, and the less steeply declivent pronotum. The lack of definite rounded pronotal spots and the rectangular median notch on the genital capsule will separate *concolor* from other members of the *stigma*-group.

Walker described his type as new based on the fact that it lacked the transverse fascia on the corium. This character is not absolutely diagnostic in this species. The type did not differ in any other respect from specimens with a transverse fascia.

Mann (1969) states that adult insects questionably identified as *concolor* were found on prickly pear.

Distribution: Mexico, Central America, and Greater Antilles.

Material Examined: Holotype: ♀, 58.135, Oajoca, Mexico. In British Museum (Natural History). 40♂, 42♀. MEXICO: Tampico; Catemaca; Barbarita; Aguazarca; Yucatan; Tamaulipas; Ocotlan; Chuminopolis; Oaxaca, Tehuantepec; Navarrete. GUATEMALA: Yepocapa; Morales; Antigua; Vizcaya; Panzos. BRITISH HONDURAS: Punta Gorda; San Antonio; Tegucigalpa. COSTA RICA: Hamburg Farm; Piedras Negras. PANAMA: Chiriqui; Colon; Barro Colorado Island. CUBA: Soledad; San Julian; San Jose; Prov. St. Clara; Santiago de las Vegas; San Blas; San Vincente Pinar del Rio; Upper Yara Valley; Camaguey. HAITI: St. Marc. DOMINICAN REPUBLIC: Pto. Plata; Sanchez. PUERTO RICO: Barranquitas; Jayuya; Mayaguez. VIRGIN ISLANDS: St. Croix. In Berlin Humboldt University Museum, American Museum of Natural History, Museum of Comparative Zoology (Harvard), United States National Museum, Stockholm Museum, Hungarian National Museum, California Academy of Sciences, J. A. Slater and R. C. Allen collections.

***Leptoglossus stigma* (Herbst)**

Cimex stigma Herbst, 1784:258, pl. 39B, fig. 1.

Hypselonotus scriptus Hahn, 1826:5.

Anisoscelis scripta Westwood, 1842:16.

Anisoscelis indocta Westwood, 1842:16.—Distant, 1901a:334.

Anisoscelis minor Dallas, 1852:452.

Theognis scriptus Mayr, 1866:101.

Leptoglossus stigma Stål, 1870:163.—Lethierry and Severin, 1894: 49.

Pronotum, scutellum, clavus and corium dark reddish brown with head, outer area of first antennal segment, pronotal calli and margins of humeri piceous; veins of clavus and corium wine red; apex scutellum, wide irregular transverse fascia on corium, and maculae on inner tibial dilations whitish yellow; head laterally and with three narrow stripes above, inner margins of first segment and segment two and three of antennae, fore and middle legs and undilated portion of hind tibiae dark tan to light brown; fourth antennal segments with base and apex ochraceous and medial portion somewhat darker; basal fourth and ventral area of hind femora light reddish brown with femora above and hind tibial dilation fuscous; femoral and tibial teeth and tubercles piceous; thoracic and abdominal venter variegated rusty reddish brown and light brown with numerous small piceous spots frequently fusing to form irregular maculae; connexivum and abdominal dorsum piceous with anterior fourth of each connexival segment and narrow areas of intersegmental sutures on dorsum ochraceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with surface above punctures largely smooth; scutellum transversely rugulose with numerous small punctures; venter with moderate amounts of short appressed and erect pale hairs and dorsum with short erect and semi-decumbent yellowish hairs; anterior pronotum, scutellum and legs with more dense longer and erect pilose hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 3.00, width head 2.28, interocular distance 1.20, anteocular distance 1.56; pronotum abruptly declivent, lateral margins strongly sinuate and entire, humeral areas expanded and obliquely ascending, humeral angles sub-acute, postero-lateral margins serrate, calli prominently elevated, area between calli slightly higher, without tubercles, disk posteriorly with median longitudinal carina obsolete, length pronotum 3.04, width across humeri 5.92, width anterior margin pronotum 1.68; length scutellum 2.04, width scutellum 2.16; labium reaching to posterior margins of third abdominal sternum, length labial segments I 3.00, II 2.88, III 1.32, IV 3.12; length antennal segments I 2.52, II 4.44, III 3.12, IV 7.20; hind tibiae with outer dilations phylliform with one shallow and two deep emarginations, occupying 79% length of hind tibiae, width about twice width of inner dilations; inner dilations lanceolate, slightly shorter than outer

and apically furnished with few small spine-like teeth; inner margins of undilated portions of hind tibiae with few small spine-like teeth arranged in a double row, length hind tibiae 9.84; length outer dilations 7.80, width outer dilations 3.24, length inner dilations 6.36, width inner dilations 1.44.

Claspers (Fig. 21) with basal median lobe low rounded and hardly prominent, gradually curving back onto shank, hook strongly curved; capsule with median notch deep and rounded with dorsal prongs prominent and acute; aedeagus with dorsal sac of conjunctiva as follows: sclerotized proximal lobes present; left median lobe long and wide, right median lobe short, blunt and simple; sclerotized anterior distal lobe closely appressed to wall of sac; one distal lateral lobe large, spinose and sclerotized the other lobe absent; total length 17.6.

The above description is of a male specimen from Santarem, Brazil.

Three specimens of the 38 examined lack the transverse fascia on the corium and all specimens have a unicolorous pronotum and are without any yellowish pigments. *L. stigma* may be distinguished from *concolor* by the smooth pronotal calli, pale pilose hairs around the area of the calli, and the more steeply declivent pronotum. The males of *stigma* may be readily distinguished by the distinctive dorsal prongs on the genital capsule. The females of the two species are difficult to separate, and will probably continue to be confused with one another. Fortunately, there seems to be a geographic separation, with *stigma* present chiefly east of the Andes in northern South America, while *concolor* is present in Central America, Mexico, and the southern United States.

Both *concolor* and *stigma* completely lack one distal lateral lobe on the dorsal sac of the conjunctiva and have the right median lobe short. Also they do not have any yellow ovoid spots on the anterior portion of the pronotal disk. These characters will serve to distinguish *concolor* and *stigma* from the other members of the *stigma*-group.

Barber (1939) and Wolcott (1948) list guava fruit as the normal host plant for *stigma* in Puerto Rico; *stigma* also feeds on achiote (*Bixa orellana* L.) (Wolcott 1948), cashew (*Anacardium*) (Barber and Bruner 1947). Hussey lists *stigma* as taken on lychee in Florida. The above host plant records more than likely pertain to *concolor* (see discussion under *concolor*).

Heidemann (1910) used the trinomen *L. stigma* var. *minor* Dallas for *brevirostris* (see discussion under *brevirostris*).

Distribution: Surinam, Ecuador, Brazil and Paraguay.

Material Examined: SURINAM: 1 ♀, St. Laurent (C. Heller S.V.). ECUADOR: 1 ♂, Rio Napo, 15-35 (Rolf Blomberg); 1 ♂, 1 ♀, no locality, 1942; 2 ♂, Balzapamba (R. Haensch S.). BRAZIL: 1 ♀, Caviuna Parana, XI-1945; 1 ♀, same except 11-1946 (A. Maller); 1 ♀, Amazon sup., Olivenca; 1 ♀, Teffe, X-24, F 6160, Acc. 33591 (H. Bassler); 1 ♀, Amazonas, Manana, Uypiranga, Rio Negro, 14 km. from Manaus 81 m., X-1941 (Alberto Rabaut); 1 ♀, Amazon sup., Teffe; 2 ♀, Brasilien; 1 ♂, 1 ♀, Amazon (Deyrolle); 1 ♀, Maranguate Mts. (Mann); 1 ♂, 1 ♀, Manaos, Amazon (Roman); 1 ♂, Rio de Janeiro, 1930; 1 ♂, Santarem, Acc. 2966; 1 ♂, same except May 1919, Acc. 6324; 3 ♂, 2 ♀, Villarica, XI (F. Schade); 2 ♀, Amer. mer., no data. PARAGUAY: 2 ♂, Horqueta, 45 m. E. of Paraguay Riv., III-23-1933 (Alberto Schulze); 1 ♂, same except III-24-1933; 1 ♀, no locality (Vezenyi); 1 ♂, Rio Yguagu, Mar. 10 (Donald Wees). In the United States National Museum, Hungarian National Museum, Museum of Comparative Zoology (Harvard), American Museum of Natural History, Stockholm Museum, Berlin Humboldt University Museum, Carnegie Museum, J. A. Slater and R. C. Allen collections.

***Leptoglossus oppositus* (Say)**

Anisoscelis oppositus Say, 1832:12.

Anisoscelis tibialis Herrich-Schaffer, 1842:12.

Leptoglossus oppositus Stål, 1870:163-4.—Lethierry and Severin, 1894:48.—Van Duzee, 1917:89.—Gibson, 1917:71.—Blatchley, 1926:223-4, fig. 44.—Deay, 1928:378.—Torre-Bueno, 1941:50.—Froeschner, 1942:594-5.—Drew and Schaefer, 1963:114.

Theognis oppositus Hussey, 1953:31.

Dorsum and appendages more or less uniformly dark reddish brown; whitish yellow transverse fascia on the corium reduced and confined to medial vein above where crossvein begins; venter light brown mottled with numerous small piceous spots; pronotum with all lateral margins entire, non-serrate; humeri rounded with humeral angles obtuse; labium extending to at least third abdominal sternum; hind tibial dilations phylliform. Claspers and capsule similar to *zonatus*. The only difference in the aedeagus is that *oppositus* has the left median lobe long and bifid at the tip, without a longer and thin secondary appendage as in *zonatus*.

In the specimens examined, there are four individuals from Texas that have two very faint and poorly defined yellowish areas and small piceous spots on the anterior portion of the pronotum. One specimen, also from Texas, has the medio-cubital crossvein yellow. None of the

individuals examined had a complete transverse fascia on the corium, although Blatchley (1926) states that one specimen from Florida had a complete fascia.

The form of the genitalia places *oppositus* in the *stigma*-group, closest to *zonatus*. The lack of a serrate postero-lateral margin on the pronotum will distinguish *oppositus* from all members of this group. Additional characters that will separate *oppositus* from *zonatus* are: the lack of a complete transverse fascia on the corium; the lack of clearly defined pronotal spots; and the previously mentioned aedeagal difference.

L. oppositus has been reported in the economic literature as attacking essentially the same crops and plants as *phyllopus*. The life history and habits were reported by Chittenden (1902, 1925). McCullough (1968) reported the acid and aldehyde compounds in the scent fluid.

Distribution: Eastern United States from Florida to New York, west to Iowa and Wisconsin, southwest to Arizona, Texas and into Mexico.

Material Examined: 49 ♂, 59 ♀, UNITED STATES: Alabama, Arizona, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Maryland, Mississippi, Missouri, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Tennessee, Texas, Virginia, Washington, D.C., Wisconsin. In American Museum of Natural History, Museum of Comparative Zoology (Harvard), Stockholm Museum, Iowa State University, United States National Museum, University of California (Davis), Chicago Natural History Museum, J. A. Slater and R. C. Allen collections.

***Leptoglossus lonchoides* new species**

Pronotum, scutellum, clavus and corium light reddish brown, head, calli and a few small spots on disk of pronotum piceous; two large, separated but poorly defined ovoid spots on pronotal disk, apex scutellum, and medio-cubital crossveins dark ochraceous; fourth antennal segments and maculae on inner tibial dilations whitish yellow; head laterally and with three narrow stripes above, inner marginal areas of first antennal segment and basal portions of segments two and three, all legs except femora above tan to light brown; outer marginal area of first antennal segment and distal portion of segments two and three, femora above and hind tibial dilations fuscous with teeth and tubercles piceous; thoracic and abdominal venter ochraceous to light brown with numerous small piceous spots frequently fusing to form larger maculae; connexivum and abdominal dorsum piceous with

anterior margins of connexival segments and narrow area around intersegmental sutures on dorsum yellow; membrane uniformly dark; pronotum, clavus and corium coarsely and closely punctate with surface above punctures uneven; scutellum transversely rugulose with numerous punctures; body with moderate amounts of short appressed and sparse short erect hairs; head behind eyes anterior portion of pronotum, scutellum and legs with more dense longer pilose hairs.

Head non-declivent with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 2.40, width head 2.28, interocular distance 1.32, anteocular distance 1.32; pronotum moderately declivent with lateral margins straight and entire, humeral areas not expanded or ascending, the humeral angles barely prominent and acute, postero-lateral margins entire, calli prominently elevated, area between calli only slightly higher, disk caudally with median longitudinal carina obsolete, length pronotum 3.36, width across humeri 5.12, width anterior margin pronotum 1.56; length scutellum 2.40, width scutellum 2.28; labium reaching to posterior margin of metasternum, length labial segments I 2.16, II 2.16, III 1.08, IV 2.16; length antennal segments I 2.40, II 3.84, III 2.76, IV 3.84; hind tibiae with outer dilations lanceolate with only one very shallow emargination present, occupying 65% length of hind tibiae, width slightly less than twice width of inner dilations; inner dilations lanceolate, shorter than outer with a few small spine-like teeth along distal half of margins; inner margins of undilated portion of hind tibiae with a double row of small spine-like teeth, length hind tibiae 9.24; length outer dilations 6.00; width outer dilations 1.44; length inner dilations 4.68; width inner dilations 0.84.

Claspers (Fig. 24) with inner basal lobe large and rounded; shank thick without a median lobe, hook thick and strongly curved; capsule with median notch deep and rounded dorsal prongs prominent and acute; aedeagus with dorsal sac of conjunctiva as follows: sclerotized proximal lobes present; median lobes present with right lobe long and wide, left lobe with tip sclerotized somewhat shorter and not as wide as right lobe and with a secondary appendage arising from approximately middle of lobe; large sclerotized anterior distal lobe present and closely appressed to wall of sac; spinose distal lateral lobes present and of same size and shape, both sclerotized; total length 17.8.

Holotype: ♂. Brazil: Nova Teutonia, Santa Catarina, VI. 28, 1943 (F. Plaumann). In United States National Museum, type no. 70226.

Paratypes: BRAZIL: 1 ♀, Nova Teutonia, Santa Catarina, IX-9-1950 (F. Plaumann); 1 ♀, same except IV-29-1948; 1 ♂, same except 11-8-1948; 1 ♂, Amazonas, Manaus, Uypiranga Rio Negro, 14 km. from Manaus, 81 m., XI-15-XII-15-1941 (August Rabaut). PERU: 1 ♀, Rio Santiago, XI-22. 24, F. 6012. In American Museum of Natural History and the United States National Museum.

The type series exhibits some important color variations. One specimen has the pronotal disk entirely dark ochraceous. Two individuals have a complete irregular transverse fascia on the corium which is confined primarily to the veins. Two specimens lack the fascia completely. The tibial dilation is relatively constant in shape, although three individuals have completely lanceolate outer dilations, lacking even a shallow emargination. Labial length varies from the posterior margin of the metasternum to the middle of the third abdominal sternum.

L. lonchoides is a very distinctive species externally. To some extent the tibial dilation (Fig. 61) resembles that of *lineosus*; the steepness of the pronotum is of the same degree as in *clypealis*; the unexpanded humeral areas and the straight non-sinuate lateral margins are close to the condition found in *crassicornis* species from Argentina. Despite the external dissimilarity, the genitalia of *lonchoides* is of the same type as that found in the *stigma*-group, with the clasper reminiscent of that in *concolor*, the capsule identical to that of *zonatus*, and the aedeagus close to *oppositus*. The lanceolate tibial dilations and the non-serrate postero-lateral margins on the pronotum will serve to distinguish *lonchoides* from all other members of the *stigma*-group.

***Leptoglossus humeralis* new species**

Pronotum, scutellum, clavus and corium dark brown with head above, outer areas of first antennal segments and pronotal humeral areas piceous; veins of clavus and corium dark tan; basal two thirds of second and third segments, entire fourth antennal segment, apex scutellum, and maculae on inner tibial dilations pale yellow to ochraceous; head below and with three narrow stripes above, inner margins of first antennal segment, all legs except femora above tan to light brown; distal third of antennal segments two and three, and femora above fuscous with hind tibial dilations dark reddish brown; femoral teeth and tubercles piceous; thoracic and abdominal venter tan to light brown with numerous small piceous maculae frequently fusing to form larger maculae; connexivum and abdominal dorsum largely piceous with some dark reddish brown areas; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate with

surface above punctures largely smooth; scutellum transversely rugulose with numerous punctures; head above, anterior half of pronotum, scutellum and legs with dense long and erect pale pilose hairs; remainder of dorsum, and venter with short appressed and semi-decumbent hairs.

Head porrect with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 3.72, width head 2.76, interocular distance 1.44, anteocular distance 2.16; pronotum steeply declivent almost vertical, lateral margins serrate caudally and strongly sinuate, humeral areas produced as broad long and tapering lateral projections and obliquely ascending, humeral angles sub-acuminate, postero-lateral margins serrate, calli barely elevated, area between calli only slightly higher, disk posteriorly with median longitudinal carina obsolete, length pronotum 4.80, width across humeri 12.4, width anterior margin pronotum 1.92; length scutellum 3.36, width scutellum 3.60; labium reaching to posterior margin of fourth abdominal sternum, length labial segments I 4.56, II 4.20, III 2.64, IV 5.40; length antennal segments I 3.24, II 5.76, III 4.20, IV 7.08; hind tibiae with outer dilations phylliform with one shallow and two deep emarginations, occupying 84% length of hind tibiae, width about twice width of inner dilations; inner dilations lanceolate, considerably shorter than outer dilations, furnished with two small spine-like teeth on distal margin; undilated portion of hind tibiae without teeth, length hind tibiae 12.3; length outer dilations 10.4, width outer dilations 3.68; length inner dilations 7.04, width inner dilations 1.76; total length 26.0.

Holotype: ♀. BRITISH GUIANA: Kartabo, VIII-1925 (S. H. Williams). In Carnegie Museum.

Paratype: FRENCH GUIANA: 1 ♀, Cayenne (Wm. Schaus). In United States National Museum.

L. humeralis has the humeri expanded in a fashion identical with those on *pallidivenosus*, but considerably longer, the width across humeri is 5.5 to 6.0 times the width of the anterior pronotal margin, whereas in *pallidivenosus* it is 4.5 to 4.8. The hind tibial dilation in *humeralis* is similar to that in *ingens* and *macrophyllus* with the inner dilation much shorter than the outer. Since there were no males available, I can only tentatively place *humeralis* in the *stigma*-group based on the above similarities.

The large size, prominently expanded humeri, long labium and distinctive tibial dilations as well as the serrate pronotal lateral margin and the lack of pale areas anywhere on the dorsum, will distinguish *humeralis* from any other *Leptoglossus* species.

Leptoglossus pallidivenosus new species
(Fig. 4)

Pronotum, scutellum, clavus and corium dark reddish brown with head, outer areas of first antennal segment and humeral areas piceous; basal half of fourth antennal segment, posterior margin of pronotum, apex scutellum, all veins on apical half of corium and maculae on inner tibial dilation whitish yellow; head laterally and with three narrow stripes above, inner margin of first antennal segment and segments two and three and apex of fourth segment, fore and middle legs and undilated portion of hind tibiae tan to light brown; all femora above fuscous with basal and ventral portion of hind femora and tibial dilations dark reddish brown; femoral and tibial teeth and tubercles piceous; abdominal venter tan with numerous small piceous spots; connexivum fuscous with anterior margin of each segment ochraceous; abdominal dorsum piceous; membrane uniformly dark; pronotum, clavus and corium finely and closely punctate, surface above punctures largely even; scutellum transversely rugulose with numerous small punctures; head, anterior portion of pronotum, scutellum, legs, thoracic and abdominal mid-venter with dense long erect pale pilose hairs; remainder of venter and dorsum with dense short appressed and semi-decumbent yellowish hairs; scutellum with lateral margins and a narrow median longitudinal area densely clothed with short appressed golden pubescence.

Head porrect with tylus and juga above level of antenniferous tubercles, tylus blunt, slightly exceeding juga and forming a rounded elevated ridge, length head 2.76, width head 2.52, interocular distance 1.32, anteocular distance 1.56; pronotum abruptly declivent with lateral margins serrate caudally and strongly sinuate, humeral areas broadly expanded and obliquely ascending with humeral angles sub-acuminate, postero-lateral margins dentate, calli prominently elevated, area between calli only slightly higher, disk posteriorly with median longitudinal carina obsolete, length pronotum 3.68, width across humeri 8.16, width anterior margin pronotum 1.68; length scutellum 2.52, width scutellum 2.52; labium reaching to middle of third abdominal sternum, length labial segments I 2.88, II 2.88, III 1.44, IV 3.24; length antennal segments I 3.00, II 5.04, III 3.84, IV 5.88; hind tibiae with outer dilations phylliform and with three deep emarginations, occupying 72% length of hind tibiae, width about twice width of inner dilations; inner dilations lanceolate, slightly shorter than outer dilations, with numerous small spine-like teeth along margins; inner areas of undilated portion of hind tibiae with few small spine-like teeth in a double row, length hind tibiae 11.2; length outer dila-

tions 8.04, width outer dilations 2.52; length inner dilations 6.96, width inner dilations 1.20.

Claspers (Fig. 23) with inner basal lobe very small and rounded; shank without a median lobe, hook strongly curved and short; capsule with median notch deep and rounded, lateral margin of notch sinuate and forming a wide angle, no dorsal prongs; aedeagus with dorsal sac of conjunctiva as follows: sclerotized proximal lobes present; right median lobe slightly smaller than left lobe and unequally bifid, left median lobe large and simple; sclerotized anterior distal lobe present; sclerotized distal lobes present, one lobe spinose, the other smaller and acute; total length 20.0.

Holotype: ♂. PANAMA: Canal Zone, Barro Colorado Island, 2 May 1956, "taken at light" (Carl W. & Marian E. Rettenmeyer). In University of Kansas (Snow collection).

Paratypes: PANAMA: 1 ♂, Canal Zone, Barro Colorado Island, 2 May 1956, "taken at light" (Carl W. & Marian E. Rettenmeyer); 1 ♀, same except June 14, 1956; 1 ♂, same except Apr. 28, 1956; 1 ♂, same except 4 April 1956; 2 ♂, Canal Zone, Barro Colorado Island, 14-II-1955 (C. W. Rettenmeyer); 1 ♂, same except 16-III-1955; 1 ♂, same except IX-X-40, "collected at light" (Jas Zetek); 1 ♀, Barro Colorado Island, 3-14-37 (S. W. Frost). In United States National Museum and University of Kansas (Snow collection).

There is some color variation in the type series: only the holotype and one other male specimen have all the veins on the apical half of the corium completely pale; the remaining individuals have some portions of the veins in this area slightly darker and not as strongly contrasting with the corium; one specimen has the pale areas confined to the usual portion of the veins that are included in the transverse fascia.

This species has a number of characters which relate it to the *stigma*-group. The ground color of the dorsum, the fact that pale pronotal markings are absent on the disc, and in some respects the shape of the humeral expansions are characters shared by *stigma* and *concolor*. The serrate lateral margins of the pronotum are similar to *impictipennis*, as well as the claspers—both *pallidivenosus* and *impictipennis* have the inner basal lobe low and rounded and both lack a well produced medial lobe on the shank. The shape of the dorsal margin of the genital capsule is in some ways like that of *ingens* and *macrophyllus* except that in the latter two species, dorsal prongs are present.

L. pallidivenosus may be distinguished from other members of the *stigma*-group by the following combination of characters: lack of pale markings on the pronotal disc, the posterior edge of the pronotum

pale yellow, all margins of the pronotum serrate, the labium not extending past the third abdominal sternum, and the genital capsule having a wide median notch without dorsal prongs.

Leptoglossus corculus (Say)

Anisoscelis corculus Say, 1832:12.—Leconte, 1859:326.

Theognis excellens Mayr, 1865:434.

Leptoglossus corculus Stål, 1870:165.—Lethierry and Severin, 1894:47.—Van Duzee, 1917:88–9.—Gibson, 1917:70, 71.—Parshley, 1923:747.—Blatchley, 1926:222–3.—Deay, 1928:377–8.—Torre-Bueno, 1941:49.—Froeschner, 1942:594, 599.

Theognis corculus Hussey, 1953:30.

Ground color varying from light to dark brown with pronotum and venter prominently mottled with small piceous spots, pale yellow irregular transverse fascia on corium narrow, confined to the veins, sometimes obsolete or completely absent; pronotum with all margins entire, broadly and obtusely rounded; hind tibial dilations lanceolate with outer dilations longer than inner dilations.

Clasper (Fig. 26) with inner basal lobe low and rounded, shank with a median lobe, hook strongly curved with a small knob on outer margin; capsule (Fig. 46) deep and rounded, no dorsal prongs; aedeagus with dorsal sac of conjunctiva as follows: proximal lobes present barely sclerotized; a pair of median lobes present, of similar size and shape, small sclerotized anterior distal lobe present; sclerotized lateral distal lobes present, one spinose, one blunt.

L. corculus and *occidentalis* are strikingly similar in appearance, but the outer tibial dilations (Fig. 57) of *corculus* occupy a greater percentage of the length of the tibiae (85–95%) and are distinctively longer than the inner dilations; in *occidentalis* (Fig. 58) both the inner and outer dilations are approximately the same length and occupy 66–72% the length of the hind tibiae. The differences between the claspers are: in *corculus* there are prominent inner basal and medial lobes on the shank; in *occidentalis* both lobes are absent. The median notch of the capsule in *occidentalis* is more rectangular with the bottom flat, not rounded; in *corculus* the notch is “V” shaped, deeper and with the bottom of the notch rounded.

Distribution: *L. corculus* has an eastern United States distribution, being found from New York south to Florida, west to Missouri, and southwest to Texas. Deay (1928) lists a single specimen without a locality from Kansas. Published records include New Mexico, Arizona, Colorado, and California (Van Duzee 1917; Blatchley 1926), but in all the specimens received from the various museums in the

United States, I have not seen a single specimen from further west than Texas. It is possible that the Van Duzee records were based on *occidentalis* specimens.

Material Examined: 45 ♂, 53 ♀, UNITED STATES: Arkansas; Alabama; Florida; Georgia; Maryland; Mississippi; New Jersey; North Carolina; Ohio; Pennsylvania; Texas; Virginia; Washington, D.C. In United States National Museum, Museum of Comparative Zoology (Harvard), American Museum of Natural History, Chicago Natural History Museum, Iowa State University, University of Kansas, J. A. Slater, P. D. Ashlock, and R. C. Allen collections.

***Leptoglossus occidentalis* Heidemann**

Leptoglossus occidentalis Heidemann, 1910:196–7, pl. 8, fig. 2.—Van Duzee, 1917:89.—Gibson, 1917:70, 71.—Torre-Bueno, 1941:49.

Theognis occidentalis Hussey, 1953:29–30, 31.

The ground color varies from light reddish brown to dark brown with pronotum (usually) and venter mottled with numerous small piceous spots; pale yellow irregular transverse fascia on corium narrow, confined to veins, sometimes obsolete to completely absent; pronotum moderately declivent with humeri broadly rounded, all pronotal margins entire; tibial dilations lanceolate, both inner and outer dilations of approximately same size and shape.

Clasper (Fig. 27) with inner basal lobe absent, shank with median lobe absent, hook strongly curved; capsule (Fig. 47) with a wide rectangular shaped median notch; aedeagus as in *corculus*.

As pointed out in the discussion of *corculus*, these two species are closely related, and the best diagnostic characters are the tibial dilations. The shorter equal-sized inner and outer tibial dilations (Fig. 58) will serve to distinguish *occidentalis* from *corculus*.

Koerber (1963) in his report on the biology and economic importance of *occidentalis*, lists 12 species of conifers that serve as host plants. Schaffner (1967) states that in Iowa Scotch pine, *Pinus sylvestris* L., appeared to be the most commonly utilized host plant. Schaefer (1965, 1968) describes some morphological aspects of *occidentalis* in his studies on the higher classification of the Coreoidea.

Distribution: From southern British Columbia and Alberta southward to Arizona, New Mexico and Texas, eastward to Iowa.

Material Examined: Syntypes: 1 ♂, Utah, Amarilla; 1 ♀, Cal. Placer Co. (E. C. Van Dyke). In United States National Museum, Type No. 13230. The ♂ specimen has been chosen as LECTOTYPE, and an appropriate label attached. UNITED STATES: 36 ♂, 38 ♀,

California; Colorado; Idaho; Iowa; Kansas; Montana; New Mexico; Oregon; Texas; Washington. In Chicago Natural History Museum, Iowa State University, Museum of Comparative Zoology (Harvard), University of California (Davis), American Museum of Natural History, United States National Museum, University of Kansas, J. A. Slater, P. D. Ashlock and R. C. Allen collections.

***Leptoglossus clypealis* Heidemann**

Leptoglossus clypealis Heidemann, 1910:195-6, pl. 8, fig. 1.—Van Duzee, 1917:90.—Gibson, 1917:70, 71.—Deay, 1928:378-9. —Torre-Bueno, 1941-49.—Froeschner, 1942:593, 599, pl. 4, fig. 42.—Drew and Schaefer, 1963:114, pl. 1, fig. 17.

Theognis clypealis Hussey, 1953:30.

Ground color varying from yellowish tan to light brown with head and scutellum piceous; a wide irregular transverse fascia on corium and anterior half of each connexival segment whitish yellow to ochraceous; membrane transparent and pale; tylus produced anteriorly as a conspicuous stout spine; humeri broadly rounded and all pronotal margins entire, tibial dilations lanceolate.

Clasper (Fig. 28) with a prominent rounded inner basal lobe, shank with a large median lobe, hook strongly curved; capsule (Fig. 48) with a rectangular shaped median notch, no dorsal prongs; aedeagus as in *corculus* except all distal lobes more heavily sclerotized and larger.

L. clypealis, a member of the *corculus*-group, is a distinctive species in this genus. The spine on the tylus and pale membrane will readily separate *clypealis* from all other *Leptoglossus* species.

Clypealis has been recorded as injurious to plums and almonds (Heidemann 1910), ornamental pomegranate (Torre-Bueno), and aromatic sumac (*Rhus aromatica* Ait.) (Froeschner 1942).

Distribution: Central and southwestern United States and into Mexico.

Material Examined: Holotype: ♂, Colorado, Platte Canon, 5-20-01 (Dyar and Caudell). In United States National Museum, Type No. 13229. UNITED STATES: 33 ♂, 46 ♀, Arizona; California; Colorado; Iowa; Kansas; New Mexico; Texas. MEXICO: 3 ♂, 1 ♀, Sabinas Hidalgo Nuevo Leon, 130VI-1939 (Ralph Hagg); 1 ♀, same except Jacala, 4-VII-1939. In Iowa State University, University of California (Davis), Museum of Comparative Zoology (Harvard), Chicago Natural History Museum, American Museum of Natural History, Stockholm Museum, Hungarian National Museum, United States

National Museum, University of Kansas, J. A. Slater, P. D. Ashlock and R. C. Allen collections.

***Leptoglossus brevirostris* Barber**

Leptoglossus brevirostris Barber, 1918:35-6.

Theognis brevirostris Hussey, 1953:30.

A small species; dorsum reddish brown with piceous humeri and occasionally a few small piceous spots on pronotal disk, venter mottled with numerous small piceous spots; a pale yellow narrow transverse fascia on corium (occasionally very faint); humeri prominently expanded, humeral angles acute to acuminate; hind tibial dilations phylliform.

Claspers (Fig. 29) with inner basal lobe low and rounded, shank with a prominent median lobe, hook strongly curved; capsule (Fig. 49) with median notch rounded; dorsal prongs obsolete; aedeagus with dorsal sac of conjunctiva as follows: sclerotized proximal lobes present; right median lobe large with its base sclerotized; left median lobe as a small sclerotized area; large sclerotized anterior distal lobe present; one spinose distal lateral lobe present.

L. brevirostris closely resembles *chilensis* in size and color, but there are a number of differences between these two species. In *brevirostris* the lateral margins of the pronotum are entire (rarely crenulate) not serrate, a transverse fascia is present on the corium, and the dorsal sac of the conjunctiva has only one median lobe and one distal lobe. *L. brevirostris* appears to be more closely related to *stigma* in respect to the similarity of the habitus and the genitalia. *L. ashmeadi* and *brevirostris* are the only North American species with a short labium and short phylliform tibial dilations.

Barber (1906) first referred to *brevirostris* as a possibly undescribed species from southwest Texas. Heidemann (1910) used the name *Leptoglossus stigma* var. *minor* Dallas, in a list of *Leptoglossus* species occurring in the United States without any further reference to the origin of the name. Barber (1918) in the original description of *brevirostris* states that he and Mr. Heidemann had previously been using the name *stigma* var. *minor* Dallas for *brevirostris*, although Barber never used the trinomen in any earlier literature.

Distribution: Southwestern United States.

Material Examined: Holotype: ♂. ARIZONA: Huachuca Mts., Aug. 6, 05. In United States National Museum, Type No. 61107. Paratypes: 6♀, same data as holotype. TEXAS: 1♀, St. Tomas, Brownsville (Charles Schaeffer). In United States National Museum. UNITED STATES: 11♂, 15♀, Arizona; California; Texas. MEX-

ICO: Baja California. In American Museum of Natural History, United States National Museum; California Academy of Sciences, J. A. Slater and R. C. Allen collections.

***Leptoglossus ashmeadi* Heidemann**

Leptoglossus ashmeadi Heidemann, 1909:237.—Van Duzee, 1917: 90.—Gibson, 1917:70, 72.—Blatchley, 1926:225, fig. 43.—Torre-Bueno, 1941:50.

Theognis ashmeadi Hussey, 1953:31.

One of the most brightly colored *Leptoglossus* species in North America. Dorsum and appendages piceous with following areas strongly contrasting orange-yellow: all margins of pronotum widely and confluent and irregular transverse fascia on corium; venter almost entirely orange-yellow; humeri moderately expanded with humeral angles acute; hind tibial dilations phylliform.

Clasper (Fig. 30) with inner basal lobe prominent and rounded, shank thick with a low median lobe, hook strongly curved; capsule (Fig. 50) with a deep round median notch, dorsal prongs small; aedeagus as in *brevirostris*.

Blatchley (1926) states that adults and nymphs were collected on mistletoe, *Phoradendron flavescens* (Pursh.) Nutt. Three specimens that I have examined from Natchez, Mississippi were also collected on mistletoe.

Distribution: Southeastern United States.

Material Examined: Holotype: ♀. Florida: St. Nicholas. In United States National Museum, Type No. 12191. ALABAMA: 2 ♀, Mobile, XI-18-1927 (Th. van Allen). FLORIDA: 2 ♀, 7-Oaks, May 1, 1908 (Van Duzee); 1 ♂, Orlando, 12-26-1908 (A. W. Morrill); 1 ♀, Dune Din, 4-1-1921 (W. S. B.). MISSISSIPPI: 1 ♂, Ocean Springs, Jan. 22, 1944, S.S. #9546. 3 ♀, Natchez, V-26-1909, "on *Phoradendron flavescens*," Hunter No. 1667 (E. S. Tucker). In United States National Museum, California Academy of Sciences, and Chicago Natural History Museum.

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